

National Institute on Alcohol Abuse and Alcoholism

RESEARCH

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Alcohol and Interpersonal Violence: Fostering Multidisciplinary Perspectives



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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

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FOREWORD

As newspapers and TV daily attest, interpersonal violence has become a public health problem of epidemic proportions in the United States. Often alcohol is associated with this violence. Yet despite numerous studies from diverse disciplinary perspectives, the role of alcohol in incidents of violence remains unclear.

The papers in this volume represent a renewed effort by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) to expand scientific knowledge of the linkage between alcohol and violence. They were initially presented at a Workshop on Alcohol-Related Violence sponsored by this Institute in May of 1992. The purpose of that meeting was to assess the current state of knowledge and suggest promising directions for future studies of the intersection of alcohol and violence. Similarly, in holding the workshop and publishing these papers, one of NIAAA's goals is to stimulate further studies that subsequently may reduce the impact of violence, particularly that which is associated with alcohol.

Like many of the pressing social issues related to alcohol, dealing with violence requires not one but a variety of approaches. Alcohol consumption causes physical and physiological changes in drinkers; but understanding how, when, and under what circumstances these pharmacological effects result in aggression or violence requires additional understanding of individual and social behavior. Hence, it is appropriate that the papers and participants come from quite diverse disciplinary perspectives, ranging from molecular biology to economics and policy studies.

Ultimately the goal of our efforts is not simply achieving understanding but developing public policies and interventions that may reduce or prevent alcohol-related violence. As a research-oriented organization, this Institute seeks to stimulate and support studies that will provide the best scientific evidence on the role of alcohol in violent behavior, to identify our areas of ignorance, and to stimulate further studies to address both immediate and longer term concerns with alcohol-related violence.

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INTRODUCTION

Research findings confirm what is conventional wisdom: Alcohol is present in a significant proportion of aggressive and violent events. As Klaus Miczek succinctly states in this volume:

Epidemiological and criminal statistics link alcohol to violence in a pattern that is large in magnitude; consistent over the years; widespread in types of aggressive and violent acts; massive in cost to individual, family, and society; and serious in suffering and harm. (p. 83)

Despite abundant empirical evidence of the presence of alcohol in violent events, however, the neurobiological mechanisms and the psychological, interactional, and social processes by which alcohol and violence are linked are poorly understood. Findings from numerous studies implicate personality, expectancy, situational, and sociocultural factors that channel the physiological effects of alcohol into behaviors that may involve violence, but whether they do so and under what circumstances is indeterminate. The accumulation of knowledge regarding the alcohol-violence linkage has been limited by conceptual and methodological barriers, as well as by gaps in communications across the social, biophysical, and medical scientific domains and academic disciplines. Consequently, the literature on alcohol-related violence, which rests on diverse definitions, methods, and models that have yet to be synthesized, resembles the proverbial attempts of the blind men to describe an elephant.

Traditionally research on interpersonal violence has been the province of criminology. Recently the public health sector has claimed violence as a problem to which a public health approach may be applied. The public health model regards alcohol-related problems as arising from three major elements that act together: the agent or alcoholic beverage itself; the individual (host) and the traits and life experiences that affect that person's vulnerability to the effects of the alcoholic beverage; and the environment (physical, interpersonal, or social milieu) surrounding the use of alcohol or regulating the individual's exposure to the agent. The model directs attention to interactions among the elements in the etiology of alcohol problems and suggests points where effective opportunities for interventions might lie.

This monograph represents an effort to draw together criminological research and public health perspectives to elucidate the problem of alcohol-related violence. It also seeks to overcome the disciplinary and conceptual barriers that have hindered earlier studies and, in so doing, begin the arduous process of moving toward the ultimate goal of preventing alcohol-related violence.

The papers in this volume initially were commissioned for presentation and discussion at a Workshop on Alcohol-Related Violence: Fostering Multidisciplinary

Perspectives, held in Washington, DC, on May 14 and 15, 1992. One way that NIAAA stimulates new research is by convening workshops and conferences designed to review and synthesize research to date and identify promising areas for future study. Given the vast literature on alcohol-related violence, we sought to convene outstanding scholars representing diverse disciplinary, methodological, and substantive perspectives in order to "take stock" of the field and guide new research for the remainder of this decade. The enthusiasm and energy generated at the workshop; the growing convergence regarding promising areas for research (e.g., a focus on the cognitive processes that mediate between the physiological effects of alcohol and situational and sociocultural factors that shape the drinker's responses); and the program announcement issued in June 1993, "Relationships Between Alcohol and Interpersonal Violence," demonstrate the measure of our success in this effort.

In publishing this collection of articles, we have several objectives. The first is to provide a comprehensive introduction to the literature on alcohol-related violence for criminologists and others who may be interested in pursuing research in this area. The recently published National Research Council's comprehensive study *Understanding and Preventing Violence* (Reiss and Roth 1993) only briefly addressed the role of alcohol and noted the complexity of its relationship with violence. This volume enlarges on both the conceptual and empirical aspects of that linkage.

A second goal is to acquaint alcohol researchers with the rich criminological literature related to violence. While each group of researchers has been examining risk factors related to different types of antisocial, aggressive, and violent behavior, too often they are not well acquainted with one another's work despite the obvious overlaps and potential for collaboration. To what extent and in what ways, for example, do parental alcoholism or other parenting practices contribute to either criminality or alcohol abuse in the children?

A third goal in publishing this volume is to set out the broad "menu" of future research issues that emerged from the workshop discussions and hope that these ideas will stimulate new studies that ultimately will help reduce the prevalence of alcohol-related violence. The authors have all responded to their initial charge to identify key questions and promising directions for further study. Moreover, several themes emerged: the need to focus on cognitive processes as the link among pharmacological, personality, and cultural factors affecting postdrinking behavior; concerns about communication among intoxicated individuals, potential targets of aggression, and bystanders/witnesses; and the effect of alcohol on information processing, particularly during the initial phases of social interactions, when they may stimulate or defuse potential violence. There also was agreement that the pursuit of generalization should be replaced by "emphasis on determining when, for whom, and under what circumstances will a particular quantity and kind of drinking alter the nature and probability of a specific social behavior" (Lang, this volume, p. 124) and by further development of subtheories and models.

This volume, like the workshop, is organized into three sections. The first addresses conceptual and methodological issues across the disciplinary domains and types of violence. The second focuses on the perspectives, methodologies, and findings of four academic disciplines: biology, psychology, sociology, and economics. The third section examines specific types of alcohol-related violence, namely spouse abuse, child abuse, and violence perpetrated by persons with co-occurring drug and mental disorders. This book consists of revised versions of the papers presented at the meeting as well as briefer papers. The latter are expanded written versions of the remarks of many of the discussants at the meeting. They are presented in this volume following the focal paper to which they initially responded.

Judith Roizen's "Issues in the Epidemiology of Alcohol and Violence" begins by identifying six dilemmas in epidemiological studies of alcohol-related violence and explores a number of the methodological difficulties and strengths characteristic of two types of research: event-based and general population studies. Event-based studies (i.e., those based on a sample of victims or perpetrators of the event) tend to suffer from sample selection biases and the absence of comparison groups. General population studies, conversely, are more representative of the population but are constrained by the relative infrequency of cases of serious events. Roizen then illustrates these problems by exploring one type of violent event—rape—and one specific general population study—Kai Pernanen's (1991) *Alcohol in Human Violence*, which examines the role of alcohol in human violence in one Canadian community. Based on the shortcomings Roizen observes in epidemiological work to date, she concludes that epidemiological research would be improved by being grounded in further qualitative research on the natural history of events. Such data would then provide a firmer basis for developing alcohol-specific theories of violent behavior.

In "Alcohol-Related Violence: Conceptual Models and Methodological Issues," a paper further elaborating on some of the ideas presented in his previously cited book, Pernanen approaches alcohol-related violence as one type of drunken behavior, and drunken behavior as a variant of sober behavior. Such an approach raises a number of subtle conceptual, methodological, and theoretical issues. One such issue is the need to bridge two widely accepted frameworks for explaining alcohol-related aggression: (1) alcohol-specific approaches that emphasize some aspect of the causal role of alcohol, and (2) processive frameworks whose multiple determinants are not necessarily affected by alcohol. To link these two approaches Pernanen uses "conceptual analysis." This enables him to "get at the (common) processes behind all the labels," treating alcohol as modifying the causal processes that are active in sober behavior. His approach, in turn, suggests the research priorities he identifies in the final section of his paper. In particular he calls for studies that focus on natural episodes of drinking and aggressive events and on the interactional implications of intoxication, taking into account both psychophysiological and cognitive changes induced by alcohol. He also calls for experimental studies that further explore alco-

hol-related cognitive changes such as cue and schema selection and interpretation after drinking. These studies will provide a basis for generating models that integrate alcohol-specific changes into a process-centered framework.

The next group of papers explores indepth the findings and limitations of the academic disciplines that have made the greatest contributions to the study of alcohol-related violence: biology, psychology, and sociology. A fourth paper adds an economic perspective, pointing out ways that economic analyses can inform public policy debates and challenging the reader to consider alcohol-related violence within a "rational decision" framework in which drinking may engender violence by changing either the objective consequences or the subjective valuation of them.

Neurobiological and psychopharmacological aspects of alcohol-related violence have progressed rapidly in the past decade. Klaus Miczek's overview of biological perspectives on "Alcohol, Aggression, and Violence: Biobehavioral Determinants" presents recent findings from studies based on animal models of aggression and experiments on neural system mechanisms that implicate brain serotonin, GABA, and neurosteroids, and suggests potential pharmacotherapies to reduce alcohol-related aggression. His findings show great promise but suggest that many questions remain regarding the exact mechanisms of the interaction between alcohol and neurobiological subsystems in the shaping of violence in animals and humans.

In "Alcohol-Related Violence: Psychological Perspectives," Alan Lang reviews the nonexperimental psychological studies that assess beliefs, expectations, and attributions related to drinking and aggression, as well as the experimental literature on alcohol and aggression. The latter discussion is treated in somewhat more abbreviated fashion in light of two recent meta-analyses (Bushman and Cooper 1990; Hull and Bond 1986) and the complementary paper by Pihl and Peterson in this volume. Lang urges researchers to replace "tweaking a variable here and there" with testing "well-crafted subtheories" and identifies a wide variety of questions awaiting investigation. These range from sorting out individual and gender differences in alcohol expectancy studies, to laboratory experiments that explore the effects of variations in individual history, situational factors, and alcohol type and dose on affective responses.

Jeff Fagan's "Set and Setting Revisited: Influences of Alcohol and Illicit Drugs on the Social Context of Violent Events" examines the nature of the social context of drinking and its influence on violence. For more than two decades, sociocultural explanations of intoxicated behavior have asserted that it is shaped by the norms of when and how to drink. Such normative explanations of "disinhibited" behavior, however, have tended to remain at an abstract level, ignoring more immediate contextual influences. Fagan explores the extent to which and precisely how the immediate setting in which drinking occurs channels the behavioral responses to alcohol and the ways that alcohol mediates the arousal effects of specific drinking contexts. He does this by examining the complex and disparate alcohol-related violence of such individuals as youth gang members and domestic partners. In the process he

provides a vocabulary and set of conceptual categories for examining contextual, situational, and transactional factors and their relationships with individual physiological, cognitive, and expectancy variables.

Economists Phillip Cook and Michael Moore observe, in "Economic Perspectives on Reducing Alcohol-Related Violence," that in comparison with other disciplines, economics has contributed little to our understanding of alcohol-related violence. Nevertheless, they illustrate the potential value of their discipline's methodologies and perspectives for examining that issue. Echoing Perneran's suggestion that sober and intoxicated behaviors may be viewed as existing on a continuum in terms of rational decisionmaking, their paper applies to alcohol-related violent crimes the analytic approach adopted by various economists and other policy scientists, who have demonstrated that restrictions on alcohol availability have reduced traffic fatalities and other costly consequences of alcohol abuse. Cook and Moore find similar evidence of a direct link between tax rates and violence rates based on a time-series analysis of the effect of beer excise taxes on alcohol-related violence. They note, however, that even if it were possible to reduce violent crime rates by raising taxes or otherwise affecting availability, questions related to the public interest in intervening in this way would remain.

Robert Nash Parker, however, in "Rational Choice and Pooled Cross-Section Time Series: Theoretical and Methodological Pathways to New Understanding of the Alcohol/Violence Relationship," notes that 20 years ago drunk driving was treated much as alcohol-related violence is today: as an individual matter rather than as a public issue. He suggests that a similar transformation regarding the public's perception of alcohol-related violence is now occurring and that empirical data related to the costs of alcohol-related violence are contributing to this change in social values.

The final section of the volume contains discussions of specific types of alcohol-related violence. Jim Collins, in "Drinking and Violence: An Individual Offender Focus," examines the evidence for a relationship between drinking, chronic alcohol problems, and the involvement of persons identified as criminals in violence. Following the suggestion of Lang and Sibrel (1989), Collins focuses on individual differences, using a drinking \times person \times situation interaction model. As in his earlier reviews (1986, 1989), he concludes that alcohol is a consistent but not very powerful factor contributing to criminal violence, that its acute effects are more relevant for explanations of the alcohol-violence relationship than its chronic effects, and that persons with multiple psychological disorders that include alcohol problems are at greatest risk of violence after drinking.

What began as Linda Teplin's discussion of Collins' paper focusing on comorbid disorders was expanded into "The Effects of Co-occurring Disorders on the Relationship Between Alcoholism and Violent Crime: A 3-Year Followup of Male Jail Detainees" by Karen M. Abram, Linda A. Teplin, and Gary M. McClelland. New

findings from their 3-year followup study of jail detainees indicate that alcoholism alone is not predictive of a subsequent arrest for violent crime, but that the combination of the diagnoses of alcohol abuse or dependence and antisocial personality disorder is. Persons with a combination of alcoholism and drug use disorder, conversely, have a significantly lower probability of arrest for violent crime than detainees with only alcohol problems. These findings highlight the need for further research on the combination of problem drinking and other psychopathology in understanding the role of alcohol in criminal activity.

In "Drinking Patterns and Intoxication in Marital Violence: Review, Critique, and Future Directions for Research," Kenneth Leonard presents a sophisticated heuristic model for explaining the role of alcohol in marital aggression that combines proximal and distal variables. He notes that within the context of interpersonal interaction, marital violence arises from interactants' appraisals of their own and their partners' behavior. These appraisals, in turn, are influenced by individual and contextual factors. Alcohol consumption may affect either proximal- or distal-level variables. Leonard begins with a review of the literature on the relationships between the drinking patterns of the husband and the wife and physical aggression, focusing on distal factors including both the husband's and wife's background, influences, and drinking patterns. He next explores evidence regarding the proximal effects of alcohol on the processes of interaction. He presents findings from his own experimental studies that identify some of the situational cues and perceptual and behavioral choice processes of both the husband and wife that contribute to the escalation into aggression and violence and show that alcohol exerts a deleterious impact on marital interactions. Like several of the other authors, his suggestions for future research emphasize the importance of examining emergent behavioral interactions and the attendant cognitive processing.

In "Child Abuse and Alcohol Use and Abuse," Cathy Spatz Widom reviews the vast literature on child abuse to glean what little we know about the connections between child abuse and alcohol abuse. Widom first explores the alcohol abuse problems of perpetrators of child abuse, then examines studies of the connection between being abused as a child and subsequent alcohol problems. She identifies several methodological limitations to be addressed in future studies as well as substantive issues for empirical research and theory building. Like Collins and Abram et al., Widom emphasizes the need to examine disorders that co-occur with alcohol problems in studies of both child abusers and their victims. Reiterating the recommendations in several other papers, she also calls for a focus on the effects of gender, personality, and drinking history variables and for development of more complex models of alcohol-violence relationships.

In sum, these papers highlight the value of approaches that are both multidisciplinary and complex in expanding our knowledge of alcohol-related behavior, including violence. They suggest both the possibilities and limitations of existing

studies and provide a rich array of suggestions for research that ultimately may lead to interventions that reduce alcohol-related violence.

This volume is the work of a large number of people who deserve grateful acknowledgment here. I want especially to commend the efforts of the authors who have contributed to this volume. They in turn benefited from the constructive criticism of the participants who served as discussants at the 1992 conference, whose names appear on pages xiii-xiv. Jan Howard, Chief of the Prevention Research Branch at NIAAA, deserves credit for guidance and support—from her initial proposal to hold this workshop through completion of this volume. Nancy Colladay's skill in planning and managing the logistics of the conference were invaluable. I am also grateful for the patience and assistance of Diana O'Donovan, who managed the contract for publishing this volume, and to Beatrice Kessler and her staff at Cygnus Corporation, who were responsible for copyediting, typesetting, and artwork.

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WORKSHOP ON ALCOHOL-RELATED VIOLENCE

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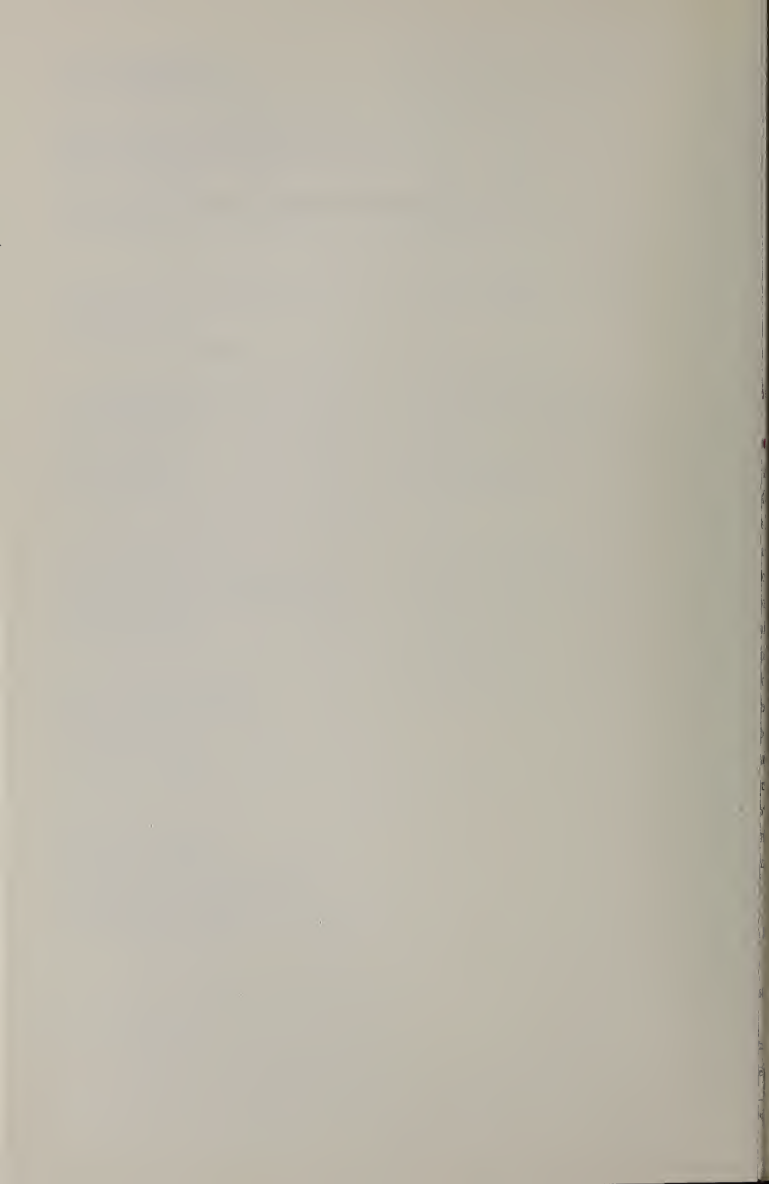
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Part 1:
Conceptual and
Methodological Issues



Issues in the Epidemiology of Alcohol and Violence

Judith Roizen¹

DEFINING THE PROBLEM

Introduction: The Six Dilemmas

In this paper and the longer work from which it is drawn (Roizen 1993), I review a number of studies on alcohol and violence that come under the umbrella of epidemiological research. I take a very broad view of what is meant by "epidemiological," often looking at small populations and at analyses rarely carried out by an epidemiologist or with the rigor of epidemiological research at its best. The work reviewed here is among the best empirical research on alcohol and violence from North America. These then are studies of different populations that contribute to our knowledge of the distribution and correlates of alcohol-related violence. This paper focuses on alcohol use in violent events rather than the chronic alcohol problems of those who are violent or the relationship between alcohol use and abuse and criminal careers.

Table 1 shows the range in percentages of alcohol-present cases in studies based on violent events and, for compara-

tive purposes, other untoward and serious events. The width of the ranges in the proportion of alcohol-present cases in different studies is the result of a number of factors. These include variable definitions of alcohol use and the violent behavior itself, inconsistent attention to alcohol in the event, and small sample sizes. The fact that there are few definitive studies in this area and that studies are of uneven quality means that a close look at each study reviewed is needed, rather than the more usual concise review of many studies.

Readers seeking to draw conclusions about alcohol and violence from epidemiological research will find themselves caught by a number of dilemmas. First, despite decades of research on these problems, *we still know little about alcohol's role in violent behavior*, although alcohol use often precedes violence. Much of the evidence on which judgment will depend comes from data collected for entirely other purposes, such as data collected in police reports or emergency room (ER) intake forms. Yet purposive research is expensive, and there is very little theoretic-

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TABLE I

**Summary of Studies Reporting
Alcohol Presence* at the Time of the Event (in percent)**

	Number of Studies	Range
CASUALTY		
Accidents (Nontraffic)		
FATAL		
Aviation	15	0.7-44
Drowning	14	12-80
Fire/Burns	19	9-83
Falls	8	17-70
Work	1	15
Other Accidents	7	9-45
Coroners' Studies	13	14-64
NONFATAL		
Fire/Burns	7	12-62
Falls	3	13-25
Work	2	1-16
Other Accidents	5	21-83
Emergency Room/Trauma Studies	3	23-63
Traffic Accidents		
FATAL		
Drivers	33	32-64
Passengers	8	16-49
Pedestrians	26	21-83
Motorcycle	8	25-63
Drivers		
Single-vehicle	19	41-72
Multivehicle	15	18-51
Responsible		
All fatal accidents	6	45-75
Multivehicle accidents	3	31-44
Nonresponsible	3	7-12
NONFATAL		
Drivers	6	3-25

cally guided empirical work to build on. Even after decades of research on alcohol and violence, Pernanen (1990) has recently asserted:

For the time being, we still need a much firmer empirical foothold, in order to assess the validity of the

relationship between alcohol use and violence in potentially less biased samples of violence episodes and of actors in these episodes than those available in official documents. We need information on the potential role of alcohol in the choice of different types of violent

TABLE I (CONT'D)

	Number of Studies	Range
CRIME		
ARRESTED POPULATIONS		
Homicide Offenders	13	28-86
Assault Offenders	3	24-37
Robbery Offenders	3	7-72
Sex Offenders	18	13-60
Homicide Victims	29	14-87
Assault Victims	5	25-60
Robbery Victims	2	12-16
Sex Victims	5	6-40
PRISON POPULATIONS		
Offenders	17	14-100
SUICIDE		
Attempters	6	30-70
Completers	13	18-66
FAMILY ABUSE		
Marital Violence (Men's Drinking)	6	6-57
Marital Violence (Women's Drinking)	2	10-27
Child Abusers/Neglecters	1	13
Child Molesters	6	32-54

*Studies use measures such as BACs, police reports of driving, witness reports, self-reports.

Source: Judy Roizen. *The Epidemiology of Serious Events: Alcohol, Casualties and Crime*. Alcohol Research Group, forthcoming.

acts and in escalations in seriousness of aggression and physical violence, as well as in the use of indiscriminate aggression in partial or total obliviousness to the nature of the victim, the setting, and the general social context.

In relation to a social problem as important as alcohol and child abuse, Leonard and Jacob (1990) have concluded that

A final difficulty worth noting is simply the paucity of literature attempting to examine this issue.

Few studies have been conducted and most of these have methodological problems....Additionally, these few child abuse studies are frequently concerned with only one or two specific forms of child abuse, thus rendering comparisons between studies or conclusions regarding one specific form of abuse difficult to make.

We know that an alcohol presence in violent events does not necessarily mean that alcohol affected the behavior of any of the participants. And more than half of

violent crimes and other incidents of violence do not involve alcohol use by the victim or the offender. Furthermore, as is the case in much epidemiological research, the precise mechanism for a relationship between the independent and dependent variables is not known, and there is no general agreement about *which* alcohol effects might be operating. More is written about the possible contributions alcohol might make to violent and criminal behavior than is written from research that attempts to establish whether there is an empirical relationship and what that relationship might be. Alcohol's presence is often considered presumptive of a causal relationship.

The second dilemma we face is the lack of cumulation in work on alcohol and violence generally and in important specific areas such as alcohol and rape or family violence. Research is scattered among disciplines, journals, and countries. If one could characterize an area of research as very "pre-paradigmatic" (Kuhn 1970), this would be it. The task in reviewing this work is to try to glean findings from work that springs from little or no common base. The process of gleaning results from disparate studies of uneven quality means that there cannot usefully be the usual overview. We can learn something from these studies only by taking a pointillist view, observing small parts in relation to the whole.

The third dilemma we confront in relation to research in this area is that social research in the last two decades or so has become increasingly complex. Looking for multiple causes of attitudes and behav-

ior and using multivariate methods for examining these potential causes have become part of the stock-in-trade of the social scientist. Behavior was ever this complex, but it is now recognized that we are no longer looking for a single or direct cause of complex behavior. Good research of the last decade and a half acknowledges this in design and analysis. But the consequences are rarely explored. First, the messiness involved in interpreting multivariate findings means that there will be no simple or single consequence for policy-makers. Correlatively, this raises the question of how research on social problems should be divided among administrative agencies and research groups.

For example, over the last two decades, as those looking at alcohol problems were slowly coming to grips with the multivariate causes of untoward behavior, drugs became more frequently implicated in many of the behaviors that we were seeking to understand. In Collins' 1981 volume on alcohol and crime, drugs other than alcohol played a small part in our analyses. Drug use is now present in violent behavior, especially criminal behavior, to a degree that makes it questionable whether it is sensible to look at alcohol and violence apart from other drugs. The work of the Drug Use Forecasting group shows that 59 percent of arrestees for violent crimes had been using drugs, often in conjunction with alcohol, in the days prior to the offense. A good case can be made that it is not just criminal violence that shows this drug presence but much other violent behavior as well. However, R. Room (personal communication,

1993) has recently argued against including drugs routinely in research on alcohol and crime on the grounds that the "alcohol will get lost" due to the often greater attention to drug problems where both are under investigation. Perhaps this need for the separation of indepth investigation of alcohol and drug problems, in part, reflects the fact that administrative control over research and policy on alcohol and drugs is divided among different agencies with differing agendas. But it is also symptomatic of the increasing difficulty we have in handling multivariate explanations of social problems.

The fourth dilemma, related to the third, arises because we live in a multivariate world in which our improved methods of social analysis have capabilities beyond what the data will usually support. In part this is because it is generally easier to develop new analytic methodologies than to find new ways of measuring behavior. It is, in part, linked to the allocation of prestige in disciplines. As Arthur Stinchcombe (1984) has argued,

[T]he higher the prestige of a piece of sociological work, the less people [who are analyzed in it] are sweaty, laughing, ugly or pretty, dull at parties, or have warts on their noses....If we range theories from the prolix fashion of Herbert Blumer—who knows how people will define the situation and consequently what they will do—to the lean and spare rational actors models that allow us to use maximization mathe-

matical methods to specify at least one feature of the behavior exactly (e.g., what the net profit will be), it is the theories that are most divorced from blood, sweat and tears that have highest prestige.

It is a conclusion of several authors in this volume (Pernanen 1991; Collins 1990; Roizen 1989) that we need to know a great deal more about what actually happens in violent situations: who does what to whom and for what reasons. This means systematic, in part qualitative, studies to find out how people actually act in situations that result in violence. There is often little prestige in this and nothing exotic in looking at the natural history of events that affect the people next door.

The fifth dilemma is that the police, courts, and medical professionals need to make judgments about alcohol's role in violence at a time when we actually know relatively little about it. Murphy et al. (1991), in examining the relationship between substance abuse and child abuse on behalf of the agencies concerned with child protection in Boston, frustratedly argued,

Orme and Rimmer's 1981 review of the research on alcoholism and child abuse concluded that the studies done up until that time had failed to provide the empirical data necessary to support the association between alcoholism and child abuse....Although from a scientific point of view it is important to maintain this

methodological skepticism, it is equally important to note that from a practical point of view, courts, protective workers, and clinicians are called upon to make decisions about the welfare of children even when definitive evidence about the impact of factors like substance abuse is not available. It is important to keep in mind that the majority of the previous studies as well as prevailing legal and clinical opinion agree that untreated, serious substance abuse plays a clear role in increased levels of risk for child mistreatment.

They continue, despite the limited empirical evidence, that "Substance abuse has been so clearly and consistently associated with child mistreatment that the Boston Juvenile Court, like other family courts, now accepts serious, untreated substance abuse as *prima facie evidence of parental inability to adequately care for a child*" (emphasis added). However, these families often have many other problems in addition to their history of substance abuse.

The last dilemma is that although some may argue that the contribution of alcohol to violent behavior is "less than meets the eye" (Collins 1989), the problem remains of explaining the very great proportion of violent acts of all kinds in which alcohol is present and which have intoxicated actors (see Parker 1992). At present, we can explain neither to what degree alcohol is effectively involved in these events nor why an alcohol presence is so prevalent.

The epidemiological research on alcohol and violence is large, diverse, and poorly integrated. This paper uses two approaches in assessing the role of alcohol in violent behavior from an epidemiological perspective. Studies of a single category of violent behavior—rape—are discussed using different research windows based on different study populations. The same exercise can be carried out in relation to other violent behaviors (see Roizen 1993). Another approach is to review in detail a single epidemiological study of alcohol and violence, in this case Pernanen's *Alcohol in Human Violence* (1990), in order to illustrate many of the key issues in epidemiological research that will need to be addressed in the next decade.

Any review of research on alcohol and violence must make a choice between a broad overview of many studies and a detailed look at a few. The importance of detailed analysis can be illustrated by an example of a review paper that discusses studies reviewed in this paper. Antonia Abbey (1992), in a review article entitled "Acquaintance Rape and Alcohol Consumption on College Campuses: How Are They Linked?" uses two studies to establish a link between these two behaviors. (These studies, Koss and Dinero (1989) and Muehlenhard and Linton (1987), are reviewed in the second section of this paper.) Abbey's review devotes only 14 lines to the actual evidence for the association. Three lines are devoted to Koss and Dinero (1989). They read, "Alcohol use at the time of the attack was one of the four strongest predictors of the likelihood of a college woman's being

raped.” But this 1989 article used *typical* alcohol use of *women* as the alcohol measure, not alcohol use at the time of event, and it proved to be a fairly weak predictor. Alcohol use by men is found to be a risk factor in Koss and Dinero (1989). They measured alcohol use at the time of the event on the part of men, but this factor is buried in myriad other risk factors and is undefined. The remaining 11 lines are devoted to Muehlenhard and Linton’s (1987) study of 635 psychology students on a college campus. On this thread of evidence, alcohol begins to be perceived as a *cause* of acquaintance rape.

Definitions of Violence

Violent behavior, as well as drinking behavior, covers an enormous number of different acts. Looking at only a single type of violent act, such as assault, a number of physically and socially different acts are implicated: the threat of assault, assault with a deadly weapon, assault accompanied by physical injury. The same objective act may be characterized as directed against a spouse, a child, or in war. Violent acts can also be typologized by how they are subjectively perceived. Perhaps the single most important typology of violent acts is achieved by dividing those that are legal from those that are not. These may be the same objective acts with the same physical and emotional consequences for the victim but may never come to the attention of the police or welfare agencies.

Pernanen acknowledged the difficulty in aggregating all violent acts in his 1976 review of alcohol and aggression. By sepa-

rating out instrumental crimes—such as crimes for gain—from others, he sought some explanatory simplicity:

I will almost exclusively deal with noninstrumental and interindividual crimes of violence. The emphasis will be on homicide partly because it is an easily definable category of crime and thus there is the least possible definitional variation between cultures and jurisdictions. Homicides are definitely interindividual. A proportion of homicides are, however, instrumental for various reasons and one criterion is not optimally fulfilled.

“Assaults,” he argued, “are probably the most non-instrumental category of violent crimes.” However, he noted, “If robbery, rape and arson were included [in an analysis] just because they are classified as violent crimes for nonscientific purposes, the explanatory accounting would have been extremely complex and more often misleading than not.”

In the past decade, proportionately more homicides are instrumental, especially those with some drug involvement, and therefore even they involve an extension of the explanatory framework.

In his recent empirical work, Pernanen (1991) defined violence operationally by specific acts of physical violence, measured at three behavioral levels: actual physical harm, threats of violence, and witnessing violence. To be counted as an act of violence, “the assailant must

clearly have shown the intention to hurt, or shown that he/she gave higher priority to reaching some other instrumental goal than to avoid hurting the respondent.”

The focus of most research on alcohol and violence, especially criminal violence, has been on noninstrumental, expressive acts of violence because it is the (often unstated) belief of investigators that these are more likely to be related to alcohol use. This is changing with the development of a body of work on nonviolent criminal offending that contributes to our understanding of alcohol and violence by illustrating the many nonviolent behaviors that show a considerable alcohol presence (see for example Cordilia 1985; Petersilia et al. 1978; Ladouceur and Temple 1985).

Other dimensions of violence that should be but rarely are used in assessing the relationship of alcohol and violence include the intensity of violent acts, duration in time, the rate of violent episodes in a time period, and the physical consequences of a single violent act.

Measurement of Alcohol Use and Alcohol Problems

Just as there are a number of types of violent acts and ways of measuring them, there are a large number of ways of measuring alcohol use. These include blood or urine alcohol levels, self-reports of quantity and frequency of drinking, drinking problems, types of beverages, congener contents of these beverages, observer reports of drinking, speed of drinking, and alcoholism. There is, in addition, variation in the cultural climate, temporally and geographically, in which

drinking occurs and the alcohol-specific norms that will affect drinking behavior.

There is a wide range of effects attributed to alcohol. These include effects on coordination, eye movements, cognition, and judgment. There are also “expectancy” effects; behavior may change when individuals think they have been drinking or when they think others have. Within these literatures there is considerable debate over the importance of pharmacological and cultural effects—debate that sometimes borders on the ideological.

In analyzing alcohol and violent events, we are typically concerned with distinguishing the acute effects of alcohol from the chronic or long-term effects. Thus we separate out the use of alcohol in the event from the alcohol problems of those involved in the event. In addition, we consider separately those who are defined by their alcohol use and problems, that is alcoholics.

Much of the research on alcohol, crime, and other violence in the last decade and a half is far better than that reviewed in the wide-ranging review of alcohol, casualties, and crime carried out by Aarens et al. in 1977. The epidemiological research on drinking patterns and problems is working its way into these literatures. Nonetheless, there remain many methodological problems connected with the measurement of drinking. A blood alcohol measurement must be taken on a person within a few hours after drinking has taken place. Self-reports of alcohol use may involve some element of deviance disavowal. Police may ignore women’s drinking because they do not expect them to be drinking

heavily. Not all members of a sample will have an alcohol measure taken, leading to possible biases in the alcohol-present subsample. The time order of these behaviors is not always clear: Violent behavior may cause drinking, both by the victim and the offender. (These methodological problems and other aspects of the measurement of drinking behavior and a discussion of alcohol effects can be found in Aarens et al. 1977; Greenberg 1981; and Roizen 1993.)

The complexity of the relationship between alcohol and violence, even from an epidemiological perspective, is captured by Pernanen (1981). In this exercise he proposes that we consider all possible measurements of alcohol as a set and then consider all violent acts as a set:

Formally, all possible relationships between the elements of the sets would be represented by the Cartesian product of those sets: {alcohol use} x {violent acts}. In addition, [there will be] some interactive combination of elements in the alcohol use variables...[C]ontemplating this way of representation may make us more sensitive to the indeterminateness of much of the discussion in this area.

(I have substituted "violent acts" for "crime" in this quotation.) We are, then, engaged in the examination and evaluation of the research on some hundreds of possible empirical relationships.

AN OVERVIEW OF METHODOLOGICAL PROBLEMS IN RESEARCH ON ALCOHOL AND VIOLENCE

Methodological and conceptual problems that arise in the definition and measurement of violence and alcohol have been briefly discussed in the previous sections. This section outlines some of the other important methodological problems and constraints. (There are a number of comprehensive methodological critiques of research on crime and alcohol, including Pernanen 1976; Roizen and Schneberk 1977; and Greenberg 1981.)

This review focuses on event-based studies and studies of the general population, each of which has different methodological problems.

Event-Based Research

By event-based research we mean samples of people to whom a serious event has occurred (e.g., victims of rape or assault) or samples of people who have initiated such an event (e.g., rapists or assaulters). For our purposes here we are looking at the amount of alcohol consumed before these events or the frequencies and kinds of alcohol problems these people have.

Perhaps the single most important methodological failing in event-based studies is the lack of, or an inappropriate, comparison group. Thus, in evaluating the alcohol problems of a sample of battered women, it is essential to know the level of alcohol problems in a sample of women comparable on other variables.

Since it is often the case that event-based samples do not have comparison groups, distributions of alcohol problems in a general population sample are sometimes used. However, the cases in the events sample may differ on many other characteristics, making a general population sample inappropriate. Where comparison groups do exist they are often convenient to the researcher rather than appropriate. ER studies of trauma, for example, will use other types of ER patients. When the purpose of the research is to measure drinking problems, it may be questionable to include in a comparison group women in labor, victims of heart attack, and those suffering from surgical problems—all people who are relatively unlikely to have been drinking.

Elsewhere we have argued (see Aarens et al. 1977) that attempting to find comparison groups for events involving intentional behavior, as most violent acts do fully, or in part, is difficult if not impossible. A comparison group must be based on *ceteris paribus* criteria. It is questionable whether these criteria can be established for someone who has murdered his wife or shot someone in a robbery. Is the person who lives next door a reasonable "control" for someone who habitually assaults children? Assessing and controlling for the degree of intentionality in violent behavior is a problem that needs to be addressed in any study of violent behavior.

A second problem with event-based samples is that they are a highly selective subgroup of all cases of the occurrence of the event, with perhaps the single exception of homicide victims, most of whom

are eventually discovered. Women who are victims of domestic violence may only come to shelters because they have nowhere else to go. This is more likely to be the case for poor women than those who are wealthy. Severely battered women may come to an ER, while others only slightly less injured nurse themselves at home. Prison offenders go through the highly selective processes of the courts, including plea bargaining and diversion.

Event samples typically include the "worst cases." Only a small proportion of rape victims, for example, ever report their rape. These reported cases are the ones that gain public attention in some way. Often these "worst cases" have multiple social, economic, and personal problems, and many live on the fringe of society. For this reason much of the possible variation in important explanatory variables is attenuated. Disproportionate numbers in these samples are poor, ill, use drugs, and are poorly educated. (See as a dramatic example of these multiple problems the review of Barnard et al. 1979 in a later section.)

Last, much of the data collected on events comes from intake and evaluation forms that are meant for other purposes, such as police reports, ER intake, and initial interviews with women seeking shelter. They are not purposefully drawn questionnaires. Correlatively, often the data analysis is in the hands of someone who is "interested in the problem" but is not skillful in the analysis of the often complicated data.

The methodology of the study of events is underdeveloped, and a signifi-

cant contribution to the study of alcohol and violence (or indeed other serious events) would be made by further work in this area. Pernanen's recent work is a good beginning.

Studies of the General Population

We are here concerned only with those methodological constraints on general population surveys relevant to studying substance abuse and violence or other untoward events. The single most important constraint is that in most social surveys, even large ones, there will be too few cases of serious events such as violent behaviors or victimizations to justify the costs of including the relevant questions. This problem becomes even more acute when it is a *relationship* that is under investigation, such as the relationship between alcohol and violence.

Related to this is the fact that neither drinking patterns and problems nor violent behavior are randomly distributed in the population. Looking at the joint relationship may involve a biased subset of relevant cases.

General population samples, even very good ones, miss large numbers of people; indeed, this is true even of censuses. These missing individuals are likely to be (or so we may think) those who have many of the problems in which we are interested. Thus, thinking in terms of Venn diagrams, we may have a large overlap between event samples and the general population; alternatively, we may have little or no overlap. That is, it is possible that a general population survey may miss altogether those most given to serious violence, although the work of Straus and

colleagues (1986) suggests that this is not always the case. If extreme cases of the dependent variable, such as criminal behavior, are undersampled in the general population survey, suspected risk factors may appear relatively weak when in fact they are of considerable importance (see for example Greenfield and Weisner 1992). One of the important unaddressed questions in the research on the epidemiology of violence is the degree to which there is a continuum of violent behaviors or whether there is a sharp disjunction, with extreme acts of violence being qualitatively different from other violence.

In this paper I am looking, in part, at the epidemiology of "events" described in general population surveys—events that may occur to a relatively few people—in contrast to attitudes toward violence, which might characterize the whole of a sample. Thus a fourth problem, which is in part described by Pernanen (1991), can be stated as follows: Although the sample of "events" from a general population survey is less selective than in event-based samples, even these are not random samples of events. There is selective recall, and as argued above, the events that find their way into a general population sample may well be a biased sample of all events. The fact that in many cases the (retrospective) period from which these events are drawn extends back in time many years creates a problem of its own. The types of violent events in recent years may be of a different nature than those that occurred 20 years ago. Patterns of violence and its modes of expression change. Thus, the distribution of types of

recent events may differ from those that occurred to people some time ago but are still the most recent event they experienced. Furthermore, without other types of events (e.g., weddings, birthday parties) than violent events for comparison it is impossible to say with any certainty the effects an independent variable such as alcohol may have.

A factor that must be accounted for in both event-based and general population surveys on problems of the type under investigation here is the reluctance of some people to admit to acts that are deviant and that, in consequence, they may seek to disavow or reinterpret.

EVIDENCE ON ALCOHOL AND RAPE

Event-Based Research on Alcohol and Rape

Research drawn from data on arrested populations largely explores the immediate situational characteristics of criminal events rather than long-term personal, social, or economic problems of offenders or victims. The principal foci of this research are violent "index" crimes according to the Uniform Crime Report (UCR); that is, crimes against persons, such as robbery, rape, assault, and homicide. The most well-considered event-based research on these specific crimes follows the basic design of the initial work of Wolfgang (1958) on homicide. This design has been used in several subsequent studies of homicide, and at least one study modeled after Wolfgang is found among those of rape, robbery, and

assault. In these studies the focus is on the characteristics of the case as a whole rather than the characteristics of victims or offenders. The data sets include a wide range of variables: ethnicity of victims and offenders, alcohol use of victims and offenders, previous criminal record of offenders, temporal patterns, spatial patterns, degree of violence, method, motive, and various observations concerning victim-offender relationships. Alcohol use is included as a single variable in these studies but is often only covaried with some of these other variables. These studies have influenced more recent victims studies, which continue to be an important source of data on alcohol and violence.

The quality of these studies depends, in large part, on the quality of the police records. Some of the studies reviewed here have been reviewed in Roizen and Schneberk (1977) and in Roizen (1982); only the better studies are discussed here, with an emphasis on the United States. The ranges of alcohol estimates in these studies are shown in table 1. Looking only at the better studies has the effect of narrowing the range of estimated alcohol presence in criminal events. It also allows us to dispose of studies that fail to meet even minimum scientific standards.

Forcible rape is defined in the UCR (U.S. Department of Justice 1988) as "the carnal knowledge of a female forcibly and against her will" and has been redefined to include males in some States. Assaults or attempts to commit rape by force or threat of force are also included; however, statutory rape (without force) and other sex offenses are excluded. In 1975 the rate of

rapes was 51 per 100,000 women in the United States; in 1988 it was 73. This varied from 83 in large cities to 36 in rural areas. In 1988, 52 percent of the known rapes were cleared. Forty-three percent of rape arrestees were under the age of 25; 53 percent were white and 46 percent black. Rape is perhaps the most underreported index crime, although report rates have grown as support for victims has increased and attention has been brought to the problem (see U.S. Department of Justice, Law Enforcement Assistance Administration 1975, and Bureau of Justice Statistics 1984 for Government estimates of victimization and underreporting). Arrest leads to a conviction in only a small proportion of cases. Dietz (1978) estimated that only 16 percent of reported rapes led to a conviction, and nearly a quarter of these were for lesser offenses (see also Clark and Lewis 1977). Thus offenders found in captured populations will differ from the universe of rapists.

There is a wide range of alcohol involvement reported in studies of rape as shown in table 2. The Selling study (1940) is noteworthy because it gives a self-reported alcohol measure, which is unusual in samples of arrestees (see also Visser 1990 for self-reported alcohol use by arrestees for all violent crimes). The level of reported alcohol use by offenders in these studies more closely approximates the estimates of self-reported alcohol use prior to the most recent offense from sex offenders in prison than the estimates of use based on police reports.

Estimates of alcohol use prior to criminal events vary considerably among stud-

ies, apparently similar in design, for several reasons. These include differences between studies in the number of cases (small numbers leading to chance variation), quality of data, or ecological differences. Both the Washington, DC, and Philadelphia studies (table 2) use a study design modeled on the 1958 Wolfgang research on homicide. A closer look at these studies can illustrate the difficulty the analyst has in trying to reconcile disparate findings. The difference in estimates of alcohol involvement is considerable although both use police reports (see table 2). Both studies were carried out in large metropolitan areas with populations comparable on most major demographic characteristics except ethnicity. In the years in which these studies were carried out, 61 percent of the population of Washington, DC, was nonwhite (largely black), while blacks made up only 18 percent of the population of Philadelphia. There are known differences in alcohol use by ethnic group. Amir (1971) reported that 42 percent of white rape arrestees had been drinking prior to the alleged crime, contrasted with 24 percent of black rape arrestees, an ethnic difference supported by other research. This ethnic difference in reported drinking prior to the crime could, in part, explain the difference in measured alcohol presence between these two studies. However, the data from Washington and Philadelphia show similar ethnic distributions of arrestees, although there are different ethnic distributions in the population. Thus this substantial difference in ethnic distributions in the two communities does *not*, in this case,

TABLE 2

<i>Empirical Studies—Rape Offenders and Victims</i>				
Author, Date, Location	Sample	Percent Alcohol Offender	Percent Alcohol Victim	Alcohol Measure
Selling 1940, Detroit, MI	100 cases, male sex offenders	43	-	Combination self-reports and police reports
Shupe 1954, Columbus, OH	42 apprehended rapists	50	-	Urine alcohol content
President's Commission on Crime 1966, Washington, DC	151 cases of rape 200 offenders 151 victims	13	6	Police reports Alcohol presence
Amir 1971, Philadelphia, PA	646 cases of rape 1,292 offenders 646 victims	24	31	Police reports Alcohol presence
Tardif 1966, Montreal	112 cases of rape 67 offenders 112 victims	31	16	Police reports Alcohol presence
Johnson et al. 1978, Winnipeg	217 "founded" cases of rape	37	36	Police reports Alcohol presence

explain the difference in alcohol presence. However, differences in demographic characteristics of samples are potentially important to explanations of differences between studies in reported alcohol involvement; these are rarely fully analyzed in relation to the alcohol variables.

Other possible explanations for the variation in alcohol presence in these studies include differences in the level of attention paid to drinking that occurs prior to criminal events in the different cities, in the availability of alcohol in neighborhoods where crimes are likely to occur, or as Johnson et al. (1978) argued,

they may be the result of a "real difference" in the use of alcohol in different geographic areas. Whatever the explanation, these two studies underscore the difficulty in obtaining consistent estimates of alcohol involvement in criminal events, even when research designs are similar and studies are restricted to one type of criminal event.

The Amir (1971) study has gathered the most complete data on alcohol presence in rape events, although the study is not primarily focused on alcohol use, and some of the quantitative analysis is relatively poor. At the time the Amir research

was carried out, its value lay in the fact that it expanded the focus of the investigation of criminal behavior beyond the offender to the event and its situational and social context. This detailed analysis of 646 rape events shows, for example, that more than 40 percent of rapes involve multiple offenders; in half of the rapes the victim and offender were acquainted, in 20 percent they were neighbors. Half of the offenders had a criminal record, but few had previous records of sexual offenses. The place of initial "meeting" of offender and victim is frequently (41 percent), and somewhat surprisingly, in one of their homes. However, 42 percent occur "on the street." Only 11 percent of rapes occur near a bar.

These data also show a strong association between alcohol use and type of interpersonal victim-offender relationship. Alcohol use was twice as likely to be found in rapes involving strangers (in 44 percent of the rape events alcohol had been used) as compared to rapes involving primary relations (21 percent of cases involved alcohol). It is particularly noteworthy that when only the victim had been drinking, the victim and offender were strangers in 77 percent of the cases. Thus, drinking in rape, as in other crimes, may play any one of a number of different roles: It may be present but have no effect; it may enhance chances of victimization when the parties are strangers; it can be present in the offender alone and exert an effect only on the offender, such as misreading social cues in relation to prevailing norms; or it may begin an evening gathering of a group of men that ends in drunkenness and rape.

Several other alcohol-specific findings are noteworthy from this study. When rape involved a pair of men as compared to a single man or a group of men, the offenders were considerably more likely to have been drinking. A number of studies of drinking and crime show excess force in alcohol-present situations. Although the number of cases in which alcohol is present in the offender only is small, all of them involved excess force against the victim. Sexual humiliation was also more likely when alcohol was present. Alcohol was present in 40 percent of the rapes committed on the weekend and 28 percent of those committed during the week. Of those cases where alcohol was present in the victim only, 40 percent occurred on a single day of the week, Saturday.

The Amir research shows that two-thirds of the alcohol-present rapes involved drinking by both victim and offender. For some investigators this raises the question of whether or not the behavior of the victim may contribute to her victimization.

"Victim precipitation," or the victim's own role in influencing the course of the rape, is a socially sensitive issue. Progress has been made in relation to the problem of blaming the victim—by police, the courts, and the public generally—in the two decades since Amir's work. Amir's analysis is not sensitive to these issues. However, keeping this in mind, Amir's work contains some alcohol relationships that deserve further investigation. Amir defined victim precipitation as

rape in a particular situation [in which] the behavior of the victim

is interpreted by the offender either as a direct invitation for sexual relations or as a sign that she will be available for sexual contact if he will persist in demanding it. Excluded are the situations where no interaction was established between the offender and the victim, and when the offense was a sudden event which befell the victim.

Approximately one in five rapes was considered to be victim precipitated. Victim-precipitated rape was more likely than other rape to involve a white victim and/or a white victim and white offender pair. In the majority of cases the offender and victim were at least acquaintances. Fifty-three percent of victim-precipitated rapes involved alcohol, compared to 29 percent of nonvictim-precipitated rapes. In 35 percent of victim-precipitated rapes both the victim and the offender had been drinking; in 18 percent only the victim had been drinking. The proportion of victims-only drinking in victim-precipitated rape was more than twice that in nonvictim-precipitated rape. However, the degree to which a victim's drinking may evoke a presumption, on the part of the police or others, of blame for her involvement in the rape event has been the subject of relatively little research (see, however, Richardson and Campbell 1982).

The finding that 60 percent of the victim-precipitated rapes involved sexual humiliation, in contrast to 18 percent of other rapes, is a startling one. Amir

argued that this is very likely due to misread signals on the part of the offender:

[S]ubjecting the victim to forced sexual intercourse means that the imputation of sexual availability was a false interpretation on the offender's part. He may still hold to his views and try to prove them by subjecting her to sexual humiliation, other than forced intercourse, or he may humiliate her as a revenge just because of the failure of his imputation.

Drinking may contribute to the misreading of signals on the part of both the victim and the offender.

Although "victim precipitated" is the wrong term for describing these rapes, they are rapes in which the victim may have increased her vulnerability by her own behavior. Drinking or some types of pub behavior may be factors that increase a woman's vulnerability. Deming et al. (1983), in their study of fatal sexual assaults, reported a positive blood alcohol content (BAC) for 40 percent of the victims; of these, half were intoxicated. These investigators suggested that the victims may have contributed to their deaths by their behavior and judgment, including the inability to escape.

The research of Johnson et al. (1978) on alcohol and rape in Winnipeg shows a much higher proportion of alcohol-present cases in their series, although the study design is similar. In their series, 74 percent of victims or offenders were drinking prior to the event. This differ-

ence may be geographic, or more likely, the result of increased attention to reporting alcohol use since the Amir research. Again in the majority of alcohol-present cases, both the offender and the victim had been drinking. This study shows a significant difference in the use of physical force in alcohol-present as compared to alcohol-absent rapes. Rapes in which both the victim and offender had been drinking involved use of substantial force in 37 percent of the cases; this is contrasted with 18 percent of the cases in which no alcohol had been used.

Looking at all alcohol-present cases, 85 percent involved the use of some force, contrasted with 68 percent of cases in which no alcohol had been used. However, the highest level of force as measured in their index of force was rarely (in 5 percent of the cases) but equally used in both alcohol-present and alcohol-absent cases.

Few sexual assaults end in homicide. Those that do end in death frequently show injuries and perversion. Deming et al. (1983) reported on 41 female cases of proven fatal sexual assault over a 10-year period in Dade County, Florida, nearly half of whom were physically traumatized and injured. Thirty percent of the victims were black, in a county in which nonwhite residents averaged 16 percent of the population over the period covered. Of the 37 victims tested, 40 percent tested positive for alcohol use. More than half of those tested had a BAC of 0.10 or higher. Only two of the victims were known to be prostitutes. The role of alcohol in sexual assault with serious injury or resulting in

homicide is one that needs further investigation, especially in light of new evidence that a substantial proportion (estimated to be between a quarter and a third) of sexual offenders are reconvicted of a sexual or violent offense (Gibbens et al. 1981), and the fact that these events are impulsive/explosive events that may involve a drinking victim.

Studies of Prison Offenders

Research based on prison offenders offers a second window on the relationship between alcohol and violence. Estimates of alcohol involvement in criminal events based on the self-reports of convicted offenders show a different pattern of relationships between criminal behavior and alcohol use than that based on samples of arrestees.

While the prison data support the view that a substantial proportion of violent offenders were drinking or drunk at the time of the crime, these data show considerable alcohol presence in other crimes as well. A detailed reanalysis of data from an early national survey of prison offenders (U.S. Department of Justice 1975; analyzed by Roizen and Schneberk 1977) showed that although drinking at the time of the crime varied by type of crime and was greater for violent interpersonal crime than for property crime, these differences were not large. Among those who had been drinking, "drunkenness" at the time of the crime was no less common for property than for crimes against the person, despite the greater skill assumed to be required for property crimes.

This pattern of relationships of drinking and type of crime from prison studies is in marked contrast to the pattern found in arrested populations. The arrest data show a strong relationship between seriousness of the crime and alcohol presence in the offender, and similarly significant differences in alcohol presence in personal violent crime as compared to property crime. Research of similar design based on arrest record data shows 7 percent of robberies (Normandeau 1968), 34 percent of rapes (Amir 1971), 24 percent of assaults (Pittman and Handy 1964), and 55 percent of homicides (Wolfgang 1958) involved a drinking offender. Comparable proportions based on the U.S. Department of Justice prison offender sample are 39 percent, 57 percent, 61 percent, and 53 percent, respectively. The prison data also reveal that a large proportion of burglaries (47 percent) and car thefts (46 percent) are committed after drinking. The national survey of prison inmates carried out in 1979 largely supports the data from the earlier national survey. However, the 1979 survey (U.S. Department of Justice 1981), based on personal interviews with 12,000 inmates, including women, gives a more detailed picture of the drinking habits of prisoners than does the earlier national survey. Violent offenders and property offenders were about equally likely to have been drinking prior to their current offense (50 percent and 46 percent, respectively). Of those who were drinking, 60 percent of violent offenders and 68 percent of property offenders reported drinking very heavily. As well, the proportions who reported being very heavy drinkers in the

year prior to the offense for which they were incarcerated were also approximately equal. Thirty-five percent of violent offenders and 40 percent of property offenders reported being very heavy drinkers.

Ladouceur and Temple (1985), using these data, compared the drinking behavior of rapists and other prison offenders. Their analysis shows that rapists are no more likely to drink heavily before the offense for which they are incarcerated than are those convicted of assault or burglary, and that they are about as likely to report feeling drunk as those committing burglary. The investigators noted, "This study finds no differences for heavy alcohol use or for level of drunkenness between offenders who committed violent and nonviolent, or sexual or nonsexual crimes." Furthermore, their results show that both rapists and other offenders are likely to drink less heavily at the time of the offense than on a typical drinking occasion in the past year. While almost 90 percent of rapists drank moderately to heavily in the year prior to incarceration, only 60 percent drank prior to the offense. There was, however, a strong positive correlation between use at the time of the offense and level of drinking in the year prior to the offense. The fact that there are no significant differences in drinking behavior by offense group suggests that criminal *behavior* may not be seriously influenced by drinking in the event, but rather that criminal offenders generally are very heavy drinkers and if alcohol contributes to criminal behavior it is in this way. Ladouceur and Temple concluded,

Because drinking during the past year is not typically associated with the commission of a crime, we conclude that drinking at the time of offense is likely to reflect a typical drinking pattern, or in some other way is unrelated to the commission of the crime. If there was a causal link between alcohol use and crime, such that heavy drinking increased the probability of committing the crime, then we would expect offenders to drink more heavily at the time of offense than on typical drinking occasions.

The work of Barnard and colleagues (1979) suggests that future research on alcohol and rape, based on samples of prison offenders, should differentiate offenders with a long history of drinking problems from others. These investigators came to conclusions similar to those of Ladouceur and Temple in relation to the failure of acute alcohol effects to explain rape or other criminal behavior. Although it has a small number of cases, the Barnard et al. study is important for its attention to the multiple social and psychological problems most offenders have. These investigators reviewed the psychiatric evaluations prepared for the Florida courts of 88 offenders charged with rape. Of the 88, 60 were classified as nonalcoholic, although others met some of the investigators' criteria for alcoholism. Both groups of offenders had experienced problems in their parental families either through divorce or death.

Nearly half of the offenders had a parent die or their parents divorce by the time the offender reached age 18. Both groups had school problems and low levels of educational attainment. The alcoholic group began drinking considerably earlier than the nonalcoholic group—at about 14 for alcoholics and over 16 for nonalcoholics. Of those called for military service, 69 percent of alcoholics and 44 percent of nonalcoholics were either rejected at entrance or received a dishonorable discharge. Work histories show frequent impulsive changes or firings. While 82 percent of the alcoholics had been married at some time, only 27 percent were married at the time of the offense. Comparable percentages for nonalcoholics are 53 percent and 25 percent. The groups differ significantly in criminal histories. While 36 percent and 45 percent of the alcoholics had been convicted of assault or other violence charges, respectively, this was the case for only 18 percent and 13 percent of nonalcoholics. About half of both groups had previously used drugs. The two groups differ significantly in their relationship to their victims. Thirty-two percent of the alcoholics raped a relative, 41 percent an acquaintance. This was the case for 11 percent and 28 percent of the nonalcoholics. In both groups, substantial proportions of offenders had medical and psychiatric problems.

In relation to the alleged offense, nearly 60 percent of the alcoholics reported drinking heavily at the time of the incident, compared to 30 percent of the nonalcoholics. Seventeen offenders reported

blackouts due to alcohol and could not describe the context of the offense at all. These investigators concluded that

For both the alcoholic and non-alcoholic prisoners, long standing and multifaceted histories of disturbed behavior were recorded. It appears therefore that alcohol abuse is but one part of the picture, with sociopathy and other forms of interpersonal disturbance contributing to the criminal act....The alcoholics stand out as more severely disturbed than the non-alcoholics in the amount and pattern of deviant behavior....[T]he data suggest that such immediate effects of alcohol [as are seen] are not sufficient to account for the observed cases of rape which arise out of long-standing patterns of deviance.

Collins and Schlenger (1989) carried out a multivariate analysis of the relationship of acute and chronic alcohol effects (i.e., the effects of long-term alcohol use rather than the immediate effects, whether pharmacologically or culturally defined) in a sample of those recently admitted to North Carolina prisons. They found that chronic effects were not significantly associated with either incarceration for a violent offense or with committing a violent offense in the year prior to incarceration. Age, race, marital status, education, and criminal career variables were included in the logistic regression models. These

investigators concluded that "it is the proximal effect of alcohol use, rather than characteristics associated with being 'alcoholic,' that is associated with increased likelihood of violence."

Can the conclusions from these different studies be reconciled? Does alcohol contribute to violent criminal behavior? Is the evidence in? The answer is that it is not. What is clear is that broad categories of offense do not adequately distinguish the actual behavior involved. Even specific event types (e.g., "rape" as compared to "violent crime") may mask significant variation in alcohol use in different types of rape events. That is, sadistic rape or date rape or incest (as compared to other types of rape or sexual offense) may well be caused by different alcohol effects and characterized by different levels of drinking, insofar as alcohol is a determinant of rape at all. Research on criminal behavior and alcohol and drug effects must, therefore, be more theoretically driven, and these theoretical investigations must control for the other social, economic, mental health, and other health problems of the offender. The theory that alcohol use is only a marker for an intercorrelated set of other problems must be considered in any investigation.

Groth and Birnbaum's (1979) extensive empirical work on rape suggests directions for further theoretically based empirical research on drinking and rape. Based on interviews with a sample of 500 sexual offenders, Groth outlines three patterns:

Anger Rape: "Sexuality becomes a means of expressing and discharg-

ing feelings of pent-up anger and rage. The assault is characterized by physical brutality.”

Power Rape: “In these assaults, it is not the offender’s desire to harm his victim but to possess her sexually. Sexuality becomes a means of compensating for underlying feelings of inadequacy and serves to express issues of mastery, strength, control....”

Sadistic Rape: “Both sexuality and aggression become fused....There is a sexual transformation of anger and power so that aggression itself becomes eroticized.”

We would expect alcohol to play a different role in these types of rape. For example, in anger rape, alcohol may enhance assaultive feelings. In power rape, alcohol may be used for “Dutch courage” or as some cases suggest as a way of trying to suppress sexual responses. Sadistic rape fits a pattern of alcohol-related violence that involves sexual humiliation and excess violence. Rada (1978), for example, has suggested that in some offenders alcohol has a direct, triggering effect on both violent sexual fantasies and behavior. The fact that many rapists report that they cannot have intercourse in the rape situation may also be an alcohol effect, one that leads to angry and sadistic responses.

Unfortunately Groth and Birnbaum (1979) paid little attention to alcohol in their work, arguing that

The use of alcohol, in and of itself, is insufficient to account for the offense. Although some offenders were to some extent intoxicated at the time they committed their assaults, these same men were more often not sexually assaultive when intoxicated. Our data suggest that alcohol may at most serve as a releasor only when an individual has already reached a frame of mind in which he is prone to rape.

However they also argued

that alcohol may contribute to the releasing of rape impulses or assaultive tendencies in some offenders...may impair such cognitive functions as reasoning and judgment...may be a necessary component in a process that evolves into an assault...in other cases, alcohol abuse and sexual abuse may constitute two parallel but independent symptoms of personality dysfunction.

Rape in the General Population

A third window on the relationship between alcohol and rape comes from general population victimization surveys. Official surveys such as the national crime survey (U.S. Department of Justice 1984) and parallel surveys in other countries estimate the overall level of victimization and the degree of underreporting of crimes such as rape. However, they give little or no attention to risk factors such as

alcohol. Pernaenen's important recent work on alcohol and violence in a general population sample does not treat sexual offenses separately. The best source of data on alcohol and rape based on a sample of the general population is the work of Koss and her colleagues, although this work is limited to college students (see Koss et al. 1987; Koss and Dinero 1988, 1989). The most recent research is based on a national sample of college and university undergraduates and includes 6,159 men and women in 32 higher education institutions. Twenty-seven percent of women reported a sexually coercive experience since the age of 14 that met the legal definition of rape, including rape attempts. Fifteen percent of women reported having been raped, and 12 percent reported attempts. Eight percent of men reported perpetrating an act that met the legal definition of rape. Five percent admitted rape, and 3 percent admitted attempts. The difference in these percentages between men and women suggest either that women's sexually coercive experiences were with men outside the higher education system, for example, with a family member, or that there are considerable differences in women's and men's perceptions of how coercive these sexual events were. There is, of course, no reason to believe that all men will admit in a questionnaire to having committed a violent act such as rape, even if they believe in the anonymity of their responses.

Eight percent of women reported having had unwanted sexual intercourse because "a man had given you alcohol or drugs." (Unwanted sex as a result of the

woman's own drinking and perceived loss of control was not included.) A man's giving unwanted intoxicants was considerably less important, however, than being "overwhelmed by a man's continual arguments and pressure," which 25 percent of women reported.

Although the fact that women's drinking patterns are found to be a risk factor for rape and alcohol use had predictive power in the discriminant analyses used, the relationship between alcohol and rape is not a particularly strong one (Koss and Dinero 1989). Using measures of typical drug use (i.e., frequency of drinking, frequency of drunkenness, and usual numbers of drinks per drinking occasion) the raw means of the drinking index, which is unreported but has a range of 3-15, were as follows: nonvictimized, 6.89; sexual contact, 7.38; sexual coercion, 7.98; attempted rape, 7.82; and rape, 8.01. Four categories of sexual coercion are used in this analysis. Sexual contact includes kissing and fondling under pressure; sexual coercion includes sexual intercourse under pressure but not by use of force.

As these data show, the differences in these scores on the alcohol use index cover a narrow range of drinking behaviors given the scope of the index, with its potential range of scores from 3-15. The investigators noted,

An inspection of the means on alcohol used indicated that women who had been raped on average received a score that reflected a usual drinking pattern

of (a) 1-3 times a month; (b) usually no more than 4 cans of beer (or equivalent in wine or spirits); and (c) getting drunk less than once a month but at least once per year. The score for the group of women who had not been victimized represented the next lower usage level in any one of these three categories.

Since the great majority of college women drink and as many as 12 percent may be considered heavy drinkers, the level of drinking represented by those women who have been raped is by no means rare (Johnson et al. 1989; Engs and Hanson 1985; Gleason 1992). Drinking patterns vary by area of the country and type of higher education institution, as no doubt do sexual norms and behaviors. These factors need further analysis before drinking can be seen as a risk factor for the sexual victimization of college women.

Women's and men's alcohol use in the event is analyzed in Koss et al. (1988). Comparing stranger ($N = 52$) and acquaintance rape ($N = 416$), based on the survey described above, shows substantial alcohol and drug presence in both types of rape. Women had been drinking and/or taking drugs in 68 percent of the stranger rapes and 55 percent of the acquaintance rapes. Comparable numbers for the men involved were 76 percent and 67 percent, respectively. About 45 percent of both men and women in both types of rape had used alcohol only; the remaining cases had used alcohol and drugs or drugs only. The use of alcohol

and drugs varied by type of acquaintance rape. The proportions of women and men (respectively) using alcohol and/or drugs in the different types of rape events were 65 and 75 percent in "nonromantic" rapes, 78 and 84 percent for rapes occurring on casual dates, 45 and 55 percent on steady dates, and 13 and 42 percent in rapes involving a spouse or family member. (Men's use of intoxicants is as perceived by the women involved.)

The level of force used by the offender varied by type of rape. Greatest force was used in stranger rapes and those involving family members. The least force was used on casual dates. However, alcohol use was greatest on casual dates for both women and men. Eighty-one percent of the men involved in rape on a casual date had used alcohol, as had 70 percent of the women. While the work of Koss and her colleagues suggests that alcohol use might be a risk factor for rape, there is no simple positive association between force and alcohol use. Family and spouse rape involved the least alcohol and drug use on the part of the offender, while alcohol and drugs were used by three-quarters of stranger rapists. In both types of rape the use of offender force is considerable. Thirty-one percent of spouse/family rapes involved choking, beating, or using a weapon (11 percent). Comparable proportions in stranger rapes were 32 percent (16 percent of offenders used a weapon). Unfortunately the Koss survey does not report the amount of alcohol and drug use, nor other characteristics of the rape events, information that would help establish the role of alcohol and drugs, if any, in these rape events. Furthermore,

as with all violent acts, there is a great potential range in the severity of the threat and the outcome. Although the rapes and attempts found in the Koss sample meet the legal definition of rape, they no doubt differ in many characteristics from the rapes found in samples of arrested and convicted rape offenders. Only 23 percent of the women to whom acquaintance rape happened described themselves as victims of rape; 44 percent of the victims reported having sex with the offender again.

Muehlenhard and Linton (1987), in a much smaller study of college students at a single university, showed a significant relationship between alcohol and drug use and sexual aggression. Comparisons of most recent dates with dates in which unwanted sexual activity occurred showed that significantly more dates in which sexual aggression occurred involved acting or feeling moderately or extremely intoxicated (as a result of alcohol and/or drugs). This was true for both women and men based on the responses of women and men reported separately. The difference in reported intoxication between the two types of dates is considerably greater from women's reports than men's. Women reported heavy use of intoxicants by both themselves and the man involved four times as frequently on dates involving sexual aggression contrasted with the most recent date. Men reported heavy use about twice as frequently. However, this study's definition of sexual aggression is very broad (i.e., including anything from kissing and touching to forced oral sex and sexual intercourse) and occurred to 78 percent of the women and was perpetrated by 57 percent of the men.

These studies raise important questions about alcohol and drug use and sexual activity. The degree to which men excuse their own sexual aggression and women explain their sexual activity to themselves and others by using drinking explanations needs further investigation. But considerably more refinement of the alcohol measures, description of the context of the event, and controls for usual drinking and drug taking are needed.

In this review of alcohol and rape we have seen the complexity in assessing the contribution of alcohol to this type of violent behavior. A number of contextual factors are shown to be related to alcohol in the rape event. These data show that many rapists have multiple social and mental health problems which may, themselves, explain this deviant sexual behavior. Rape offenders, like other violent offenders, are typically heavy drinkers and drug users. Alcohol use in the event may represent no more than everyday use. Extending the study of rape into the student population as Koss and her colleagues have done suggests, however, a rather different set of correlates of rape than we find in the prison offender population.

In the next section we turn to a single study that looks in detail at alcohol's role in violence and is the most important contribution to the epidemiological literature in this area of research in many years.

THE RECENT WORK OF PERNANEN

The recently published work of Pernanen (1991), *Alcohol in Human Violence*, deserves a special place in this review for a

number of reasons. First, the work is wholly devoted to the problem of alcohol and violence, whereas much of the other work reviewed here has many competing agendas, often raising more questions than giving answers to the question of the relationship between alcohol and violence. Secondly, and of very considerable importance, is the fact that Pernanen's work is cumulative in relation to the study of alcohol and violence. Unlike many of those who carry out research on alcohol and violence, he is not making an occasional foray into the field. His work is based on his own considerable work in this area of research and a close reading of that of others, including the very large related experimental literature. This sort of cumulative research is rare in contemporary social science where analysts often move from problem to problem as funding or interest compels. Third, the work is of a very high standard. The survey is a classic piece of survey research in an area of research that is extremely patchy with respect to quality.

As Pernanen wrote, "The main strength of these data is that they represent 'real' naturally occurring events of aggression and violence," which can provide much needed descriptive analyses of aggressive episodes and their incidence and prevalence and can serve as models for controlled studies of aggression. As he argued, "Both middle range theories and middle range data have been missing from the study of human aggression." While underscoring the importance of description in the study of violence and the paucity of good data, despite the many studies of

alcohol and violence, it is description in the service of providing an explanatory framework for alcohol-related violence that is the strength of this research.

Inevitably, in a tightly argued book-length manuscript, the reviewer must select from among the many findings a few that give the flavor of the work and epitomize its essential contribution. The summarized findings below include some of the important descriptive findings from the survey as well as several that will contribute to explanation and theory in this area of research.

The survey is based on a probability sample (Thunder Bay, Ontario) of 933 men and women aged 20 and over representing a city of 112,500. Of these 933 respondents, 492 had been victims of violence at some time since they were 15 years of age. The most recent incident of violence is the subject of most of the analyses. Violent incidents in the 12 months prior to the survey are also analyzed but these numbers are smaller. About 10 percent of the 495 men in the survey had been victims of violence, 10 percent had been threatened with violence in the previous year, and 39 percent had witnessed violence. Comparable figures for women are 10 percent, 6 percent, and 28 percent.

This is a victimization study in the sense that violent incidents are described from the perspective of the victim. The focus of the study, then, is the role of alcohol in violent victimizations, not the role of alcohol in the aggressive and violent behavior of the respondents. A comparison study of violent crimes ($N = 781$)

based on police records was carried out at roughly the same time. Only 4 percent of the violent episodes from the interview survey were recorded by the police in the year of the study, although the police were made aware of 15 percent of the episodes. This demonstrates the fact that the analysis of cases from police records involves a small and selective subset of all cases of violence, although these probably consist predominantly of the most serious cases.

Although the risk of violent victimization in the 12 months preceding the survey was about equal for men and women, 60 percent of male and 44 percent of female respondents reported having been victimized since age 15. There is the problem of the adequacy of recall for the violent incidents that make up the main analysis: 40 percent of the index incidents, that is, the 492 incidents, occurred during the 3 to 4 years prior to the survey; however, another 40 percent occurred more than 8 years prior to the survey. Of these incidents, men were disproportionately likely to have had their last victimization in their youth, while women reported more recent incidents.

Some of the major findings of this work are outlined here.

Pervasiveness of Alcohol

In more than half of the index incidents of violence in the community sample and 42 percent of the violent crimes reported in the police sample, either the victim, the assailant, or both were drinking. In the interview study 51 percent of the assailants (note: as perceived by the victims) and 30 percent of the victims had

been drinking; in the violent crime study the comparable percentages were 31 percent and 26 percent. Pernanen concluded:

We now have some evidence that, at least in a cultural sphere where alcohol is implicated in criminal violence, it is also abundantly present in day-to-day violent confrontations. The relationship between alcohol use and severe aggression, as reflected in studies of police and court records and in emergency room samples of injured persons, does not seem to be mainly an artifact created by biasing selection processes.

Nor, as he rightly concluded, can this relationship be seen as pertaining only to a small group or particular subcultures in the population. The question of the representativeness of event samples is often raised, and this work of Pernanen's gives us an answer based on a general population survey in one community.

Differential Risk of Alcohol-Involved Violence

Many studies show that both heavy drinking and drinking problems are related to gender and age. The data from Thunder Bay, perhaps not surprisingly, also demonstrate that particular demographic groups in the population have higher risks than others of alcohol-involved violence and that this is in excess of what would be expected merely by the frequency of their drinking. Young men are most at risk, although all young adults are at greater risk than others.

The risk of injury from the index violent incidents (i.e., not those in the year prior to the survey) was surprisingly high. Twenty-six percent of the incidents resulted in a physical injury; 11 percent involved seeking medical attention. It is an important finding of this work that alcohol-present episodes did not result in any greater rate of injury than those that did not involve alcohol. However, the risk of injury increased with the amount of alcohol consumed by the victim.

Selected Findings on Alcohol and Violence from Pernanen's Work

The findings reported here are important in their own right in the development of both empirical research and theory in this field; they are also some of the findings that refer to themes from other studies reviewed in this paper and in the longer paper from which it is drawn. Included is a comparison of drinking during violent episodes contrasted with usual drinking patterns and an examination of differential alcohol involvement in violent episodes involving acquaintances versus strangers, with different gender mixes of victim and assailant, and in different locations.

1. The amount of alcohol consumed by both men and women in their index (i.e., most recent) victimization was considerably higher than the mean levels of consumption during their most recent drinking episodes. This suggests the need for further work on victim precipitation or vulnerability to violence.

2. Alcohol involvement differed according to the gender of the victim and assailant. Total alcohol involvement in

episodes of a male victim and assailant was 62 percent, of a female victim and male assailant was 53 percent, and of a female assailant was 27 percent. Violent episodes between men not only had higher levels of alcohol involvement but were also more likely to lead to injury.

3. Alcohol involvement differed according to the relationship between the victim and the offender. Total alcohol involvement was greatest in episodes between strangers. Seventy-eight percent of these incidents involved either a drinking victim or assailant. In 36 percent both were drinking. More needs to be known about these "stranger" episodes, which make up nearly a quarter of violent episodes.

Over half of the violent incidents reported by women involved conflicts with their spouses. Only 12 percent of the incidents reported by men were reported as family violence. This difference is difficult to explain without more data. It may be that men "forget" their incidents of family violence or that men do not see them to be as serious as women do. (As we have seen in the previous section, some men have perceptions of sexual coercion that are quite different from those of women.) Nearly half of the violent episodes between spouses involved drinking by the victim or the assailant. The victim (in most cases the wife) was drinking in only a third of these episodes. Pernanen noted, "The serious nature of alcohol use in some marital violence is probably reflected in the finding that divorced or separated respondents had an alcohol involvement of 69 percent in their

most recent subjection to violent acts.” He noted that the N is small ($N = 37$). One-fifth of episodes of family violence resulted in an injury.

4. Based on the episodes of violence in the year prior to the survey, Pernenan found no “clear-cut relationships between the typical drinking frequency of the individual and the three types of experiences of aggression during the preceding year: men who were more frequent drinkers were not more likely to experience acts of violence, threats and *witness violence* than were other men.” The same relationship was not true for women. Among both men and women, those who drank once or twice a week were considerably more likely to witness violence (and presumably to increase their chances of being participants) than more frequent drinkers. He observed, “The point that this discontinuous finding should make clear is that, even though a statistical connection between alcohol use and aggressive encounters seems very likely in many jurisdictions and cultural spheres, we should not expect a linear relationship between frequency of drinking and these experiences.” This is an important point, one which has consequences both for choice of analytic methods and choice of alcohol variables used in research on alcohol and violence. There is growing evidence that heavy infrequent or binge drinkers may be disproportionately involved in violent behavior (see, for example, Kantor and Straus 1987). This needs further exploration.

5. The findings on violence that occurred in a tavern are noteworthy. All except one of the assailants had been drinking. The victim had been drinking

in about 80 percent of the cases. The proportion of injuries resulting from these violent encounters was almost twice as great as from incidents that occurred in the respondent’s own home. This may reflect the fact that tavern violence reported in the interviews occurred in large part among strangers.

Contributions of Pernenan’s Recent Work to Theoretical Debate

Pernenan considered three “clusters of hypotheses” relevant to determining the *role* of alcohol in violence: severity and persistence hypotheses, indiscrimination hypotheses, and elicitation hypotheses. The latter is not dealt with in this book of Pernenan’s but will be in later work; it suggests that when alcohol is added to any situation, the risk of eliciting an aggressive response is greater. The other two hypotheses are briefly reviewed below.

Alcohol and severity of choice of acts and outcome

Tests of seriousness of the choice of violent acts and their consequences in relation to alcohol-involved violence are important in the development of a coherent theory of alcohol-related aggression. Severity hypotheses are relevant both to disinhibition-type theories and to establishing whether a dose-response relationship exists in relation to alcohol and untoward outcomes. The “persistence” hypothesis is related—that an intoxicated aggressor will persist in violence beyond what would occur in “normal” violence. Wolfgang and his students have called this “excess violence.”

Pernanen concluded that "no support has been found for a general severity hypothesis in these data." This is largely based on the failure to find a difference in injury outcome between drinking and nondrinking episodes and the failure to find a difference in rate of injury related to the assailant's drinking. There is limited conditional support for finding a difference in rate of injury when the assailant was judged to be drunk, but the difference is not a large one.

In my own view, the evidence is not in on this question. These data are not sufficiently finely drawn to support such a conclusion. The fact that there were both (1) a clear relationship between very heavy drinking on the part of the victim and the risk of injury and (2) an elevated risk when the assailant was judged to be drunk suggests that there may, indeed, be a relationship between level of drinking and severity. Furthermore, it is in the nature of the sample that it may not capture many very heavy and frequent drinkers. Thus, if there were a relationship between amount of alcohol consumed and the severity of the outcome, this relationship would be attenuated. The two weakest aspects of this research program as a whole are the alcohol variable for assailants' drinking (i.e., the respondent's memory of what the assailant had been drinking) and the length of time between an index incident and the survey.

Indiscrimination in acts of violence and alcohol

Pernanen defined these hypotheses as follows:

The 'indiscrimination' hypotheses state that acts of aggression after drinking will not be as well attuned as acts of sober aggression to the requirements of the situations and the social norms applying to it, such as the restraints (or 'inhibitions') related to the location, the types of acts performed, the characteristics of the target of aggression, and so forth....[A]cts performed would be as serious as in other social contexts, regardless of normally attenuating factors.

There is some evidence in this work of "less discrimination" in the use of violence in relation to how well the assailant and the victim knew one another. For example, in relation to the gender of the victim, Pernanen concluded that his data contain "rather clear evidence of the continued importance of conditional social-contextual cues and normative factors in the determination of types of aggression and physical violence after drinking." In the alcohol-present episodes, more violent acts such as punching and kicking were used against both male and female victims, but the difference in types of acts between alcohol-present and alcohol-absent is small. Less severe and less indiscriminate violence is generally used against female victims, and this does not change substantially even when alcohol is involved in the incident and when the assailant is drinking.

Pernanen concluded, "It can be said that once aggression occurs in connection

with drinking, it has the same general character of a 'guided doing' [using Goffman's term] as in sober conflict." Even in incidents involving both violence and drinking, normative constraints are still operative. This is, of course, consistent with the theories of drunken comportment of MacAndrew and Edgerton (1969) and others. However, Pernanen is not yet prepared to declare this debate over. He further argues, "Nonspecific 'indiscrimination' and 'excessiveness' may be more characteristic of determination in the initial stage of a conflict, in the processes involving instigating cues and cognitive issues in angry arousal, and in the process by which these instigations produce open conflict."

These are important findings. However, we must question the extent to which such findings are generalizable. Certainly they have relevance to everyday violence, but as Pernanen himself points out, "Samples of violence that occur in specific subcultures with more extreme drinking habits, such as 'skid row'...could yield different results altogether." Larger, more urban communities with a greater representation of those who use excessive violence, alcohol, and drugs may also yield different results.

Although Pernanen is concerned with motivations and meanings, social surveys such as his, however well carried out, do not allow us to pull out the important scenarios that may give greater insights into alcohol involvement in violence. Looking at "victim-offender" relationship, location, etc., separately is no substitute for getting into the context of violent events and the "minds" of those involved.

THE FUTURE OF EPIDEMIOLOGICAL RESEARCH ON ALCOHOL AND VIOLENCE

One section of this review concentrated on a single type of violent behavior, another on a single study of violent behavior generally. The longer review from which this paper is drawn (Roizen 1993) looks in similar detail at other types of violent criminal behavior and at the research on domestic violence using the same "windows" as in this paper. What can we conclude from this research about the relationship between alcohol and violence?

First, although there is a considerable alcohol presence in both offenders and victims involved in violent events, there is evidence that they have many other social, economic, and mental health problems. Additionally, alcohol use is related to a number of situational variables that describe violent events. These different types of variables are rarely included in the same piece of research. The strength of the alcohol explanation is therefore not tested. In addition, there is some evidence that the co-occurrence of multiple social and health problems may preclude a clear explanation of alcohol's relation to many violent behaviors. This is, in part, a consequence of the multivariate explanations of social behavior, and it is a problem that research and policymaking have not adequately confronted.

Second, typologies of violent events that are theoretically driven are rare in this research. Global divisions of behaviors into such categories as "violent" versus "nonviolent" behaviors, or even groups of behaviors such as "homicide" or

"domestic violence," do not offer enough specificity to establish clearly alcohol's relationships with the behavior in question, although there is often considerable alcohol presence in samples of these behaviors.

Third, empirical studies of alcohol and violence are typically unclear about precisely which effects of alcohol are under investigation. Thus, in the same piece of research the sociobehavioral effects of alcohol as an excuse for untoward behavior are not distinguished from the pharmacological or other effects. There is growing evidence that violence is a rational choice of particular actors. Yet alcohol-involved violence is often viewed as irrational, uncontrollable behavior. But these effects are often not clearly explicated. Often researchers do not even address the question of why alcohol is included in their research. Why, for example, do Koss and her colleagues include alcohol and drugs as risk factors for sexual aggression? What theories of alcohol's effects lie behind the inclusion?

Fourth, the methodology of studying untoward events such as violence is underdeveloped. This particularly affects choices of comparison groups, which are of fundamental importance in establishing the use of alcohol by persons who are similarly situated in relation to variables of theoretical importance to a study.

If epidemiological research on alcohol and violence is to contribute to our understanding of the role of alcohol in violent events and violent lives, each of these four factors needs considerably greater attention in future research.

Ironically, this progress may depend on the development of qualitative research on the natural history of events, which will lead to the development of alcohol-specific theories of violent behavior.

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Alcohol-Related Violence: Conceptual Models and Methodological Issues

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INTRODUCTION

This paper discusses some conceptual, methodological, and theoretical issues that are central in explaining the statistical associations found between drinking and violent behavior. These three types of issues are closely linked. The choice of a conceptual framework, for instance, affects both methodological and theoretical decisions, although the consequences of this influence in most cases are not open to view. Implicit conceptualizations are always present in research paradigms and theoretical frameworks and mostly accepted without question or analysis. Conceptual analysis, by revealing such hidden assumptions, may help in constructing theories of greater scope and power, and in integrating findings and explanatory attempts from different academic fields and subfields. Extracting the conceptual foundations of present research approaches may also cause us to revise or broaden our methodological decisions in fundamental ways.

Even the most central conceptual issues in the study of alcohol-related vio-

lence cannot be covered within the format of the present paper. A selection is necessary and inevitably is colored by the present interests and past activities of the writer. My main starting point for theoretical analyses has been the associations found between alcohol use and criminal violence in society. In my empirical research I have studied real-life episodes of aggression and drinking. The orientation toward natural events is reflected in the emphases of this paper and in the suggestions made regarding future research.

Following a discussion of conceptual questions and suggesting a widening of the present approaches, I present a model of alcohol-related aggression in which I have applied some of my own suggestions for new conceptual frames. The model also is meant to illustrate integrative possibilities among what is known about the psychophysiological effects of alcohol, observed behavior after drinking in natural settings, and some sociocultural aspects of alcohol use and alcohol use settings. Finally, I discuss some concrete methodological issues and suggest some testable

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hypotheses regarding the determination of alcohol-related violence.

I have concentrated on the task of *explaining* the connection between alcohol use and violence. This should not obscure the continuing need for research with mainly descriptive aims: measuring the strength of the connection in different populations and with different methods; studying descriptively episodes of drinking, anger, and different types of aggression; and carrying out indepth descriptive studies of violence-prone populations of individuals. Conceptual and methodological questions linked to relatively long-term drinking patterns, alcohol abuse, and alcoholism and their relationship to violent behavior naturally also deserve to be discussed. However, even a modest attempt to address these issues would require a paper of at least the same length as this one. There is also some evidence that acute alcohol use has a greater impact on the risk of violent behavior than do alcoholic drinking patterns (Collins and Schlenger 1988).

CONCEPTUALIZATIONS IN THE STUDY OF ALCOHOL-RELATED AGGRESSION/VIOLENCE

A central conceptualization guiding much of the discussion in this paper is that the relationship between alcohol use and aggression is made up of multiple partial processes. The summarizing statements concerning proportions of assaults or homicides that have been preceded by alcohol consumption by participants (e.g., 60 percent of homicides in a jurisdiction were preceded by drinking) appear to refer

to a simple and unitary empirical fact. Nonetheless, these figures are based on aggregations of numerous empirical processes and alternative causal pathways. Although we can meaningfully speak of *the* statistical relationship, we should not be misled into trying to uncover *the* causal relationship, process, or explanatory model, as some explanatory conceptualizations (e.g., those using the term "disinhibition") sometimes are applied.

I do not mean to imply that it is not possible to arrive at a nomothetic understanding of the alcohol-related violence that occurs in natural situations. Undoubtedly there is a hard core of physiological, psychological, and behavioral alcohol-induced changes of great importance to the explanation of alcohol-related violence. There are also alcohol-linked social-definitional or cultural factors of great importance in the explanation of alcohol-related violence, as has been shown by cross-societal analyses (MacAndrew and Edgerton 1969; Marshall 1983; Washburne 1961) and studies on the cueing effects of alcohol and phenomena associated with alcohol and drinking (Goldman et al. 1987; Goldman and Roehrich 1991). Even the causal impact of the psychophysiological processes varies with social, situational, and cultural factors. These processes may give rise to quite divergent behaviors depending on external circumstances. A major challenge for research is to find the empirical processes through which such different aspects of alcohol and drinking interact with environmental factors as well as individual predispositions to produce aggressive behavior.

Alcohol-Specific and Processive Conceptualizations

A very general distinction can be made between theoretical and methodological approaches that try to explain alcohol-related aggression: those that use *alcohol-specific* (alcohol-driven) conceptual frames which stress the causal role of some aspect of alcohol, and those that use multiple determinant *processive* frames as a starting point. The latter uses regular (nonalcohol-affected) *processes* as a departure in integrating the contributions of one or more alcohol factors with other factors in the etiology of alcohol-related violent behavior. Alcohol-specific conceptualizations, on the other hand, foster *trait* explanations. In contrast to process explanations, they assume a priori some characteristic(s) of alcohol to be the main cause of alcohol-related violence; they do not specify any processes whereby, for instance, environmental or situational factors interact with alcohol to increase the risk of aggression. It is quite possible that the two types of approaches may ultimately converge on valid explanations of the fact that alcohol use elevates the risk of violent behavior. However, it is likely that these explanations will be processive in nature, with alcohol-specific explanations being used only as a type of shorthand for processive explanations.

The classification into alcohol-specific and processive explanations is meant to highlight an important general distinction in the way that alcohol-related behavior is explained. Like most other classifications this one inevitably simplifies reality to some extent but helps display the self-

imposed limitations and inherent strengths of present approaches.

In classifying individual causative factors or models that have been suggested in the literature, one has to resort to "default interpretations" in many cases, since reports often fail to specify how the particular causal factor or process fits into a more comprehensive scheme of explanation. In a few cases the authors seem to suggest that such integrative schemes are not needed and that their explanations fully account for the relationship between alcohol and violence without any significant residue. When such is the case or when multifactorial causal processes or integrative possibilities are not central to the explanations proffered, I have chosen to classify them as "alcohol specific."

Alcohol-specific explanations have dominated theories on alcohol-related aggression, in part because such explanations are simple and make immediate sense. Their simplicity is evident in the following examples of alcohol specificity: alcohol causes disinhibition and thus violent behavior; alcohol is a cue or semiotic sign for counternormative behavior including violence; alcohol is linked to expectancies regarding violent behavior and therefore leads to violence. Such explanations undeniably are partially true: Even processive explanations concede that *something* about alcohol contributes to the increased risk for aggression in connection with drinking.

The distinction between alcohol-specific and processive explanations cuts across disciplinary boundaries. There are many types of candidates for what it is

about alcohol that has this central causal role. The alcohol factor chosen may be one of its pharmacological effects, or the cue value that a bottle containing alcohol has for some drinkers to activate expectations regarding behavior after drinking. The causally active aspect of alcohol may also be the sociocultural meaning of alcohol as a symbol of freedom or youthful rebellion, or the planned use of drinking as an excuse for violence ("deviance disavowal," see McCaghy 1968). Moreover, some alcohol-specific models try to explain alcohol-related behavior by referring to specific normative structures pertaining to alcohol use occasions (such as "time-out," MacAndrew and Edgerton 1969). Although these approaches differ greatly as to the type of explanations that they suggest for the alcohol-aggression link, they are alike in that they center their explanation around a specific property of alcohol, without paying much attention to the processes that bring about alcohol-related violence and the contingent factors that have to be present before such processes are activated in natural settings.

The alcohol-specific type of framework is most common in strictly experimental or otherwise (semi)controlled approaches. This is not surprising since the statistical requirements for testing alcohol-linked hypotheses limit the number of nonalcohol variables that can be included in experimental designs. The contribution of nonalcohol factors is therefore by methodological necessity minimized or relegated to the category of extraneous (and for the purposes of the experiment, random) influences not to be

entered into the explanatory model. It is very difficult indeed to study the events or processes leading to aggression after drinking using strictly controlled methodology. It follows that a processive approach to explanation is more easily adopted in the study of real-life episodes of drinking or aggression.

From a real-life perspective it is therefore natural to argue for less alcohol specificity in the explanation of alcohol-related aggression and to opt for a processive approach. In this conceptualization, processes that cause alcohol-related aggression and physical violence are seen to be basically the same as those that cause sober aggression and violence. Accepting these processes as a starting point, a major task of research becomes one of looking for alcohol-linked changes in process-contained factors that will help explain the alcohol-related behavioral outcome (Pernanen 1991). Since processive approaches have hardly been tried in the study of alcohol-related violence, the discussion below in large part will try to bring out the additional benefits that may accrue from also studying the social interaction, cognitive orientation, and other processes that occur in the production of violent behavior after drinking. Studying such processes also means keeping a keen eye on the *sequences* of events that lead up to violence after drinking and the different causal roles that alcohol may play in these separate, sequentially ordered events.

Most alcohol-specific explanations neglect all but one aspect of alcohol. For instance, "disinhibition" neglects any expectancy or other semiotic dimensions

of drinking, "time-out" limits the explanatory options to socially normative influences, and drinking as a semiotic proxy for rebellious behavior among youth touches only one pathway of the potential multidetermination that increases the risk of violent behavior after drinking. Most alcohol-specific experimental approaches concentrate on the proximal processes linking drinking with aggression, for instance, the connection between a frustrating or provoking stimulus and the extent of the experimental subjects' aggressive responding. Studying in addition naturally evolving individual behavior and social interaction after drinking will facilitate conceptualizations that include distal processes in which alcohol is a causal factor by helping to bring about the proximal incitement to aggression. This is one aspect of the sequential nature of the link between alcohol use and aggressive behavior.

The Drinker as an Object of Alcohol Effects and Subject in Action

Several of the research approaches that attempt to find explanations for the alcohol-aggression link use an explanatory structure in which the alcohol-affected person is an object upon which alcohol works its effects, whether they be physiological or cognitively mediated effects. The alternative conceptualization treats intoxicated persons as subjects actively trying to orient themselves in the situa-

tion by trying to use basically the same cognitive means as are available to them in a sober state. Rather dramatic changes, depending largely on the level of alcohol in the blood, will have occurred in the values of some central parameters after drinking, and these will affect behavioral outcomes. However, there is no conceptually compelling reason to introduce totally new alcohol-specific traits or processes in the explanation of alcohol-related behavior—especially traits that bridge causal sequences in which many other empirical contingencies in fact determine the course of events.² Rather, alcohol should be seen as modifying the causal processes that are also active in sober behavior. This means that, as with sober aggression and violence, among the central factors one should take into account are the social context and the motivations and definitions that the adversaries bring into an interactional situation. Starting from this type of conceptual framework one would then examine what risk-increasing (and even risk-decreasing) factors and processes are more common when at least one interactor has been drinking.

This type of approach asks us, in essence, to go back one step in our conceptualization of what is central to the explanation of a great deal of alcohol-related aggression. Instead of reaching for direct, specific, and convenient explanation of drunken phenomena, one might

² I am here thinking of the trait-like conceptualizations of the following kind: alcohol as "releasing" deep features of the personality or alcohol as a catalyst, trigger, or disinhibitor to violence. Explanatory conceptualizations that introduce specific alcohol-related normative structures such as "time-out" or specific alcohol-related motivations like "deviance disavowal" also err in this simplifying manner.

attempt a strategy of conceptual coordination of what is known about alcohol's effects on affect, mood, central aspects of cognitive processing, and general behavior with the theoretical questions one faces in trying to explain real-life aggression/violence after drinking. These ideas will probably become clearer after reading the discussion of methodological considerations in a later section of this paper—in particular the ideas on the availability of cognitive schemas and the processes of cue selection after drinking.

Despite the dominant position of cognitive psychology in the general explanation of behavior during the last two or three decades (see, e.g., Averill 1983), there have been no systematic attempts to work within a broad cognitive conceptual frame in the explanation of alcohol-related aggression. The stimulus-response (or "environmental control") paradigm has dominated at least the methodological aspects of psychological experimental research on alcohol-related behavior. In the behaviorist tradition the cognitive and orientational life of the drinker by definition is outside the purview of both empirical study and theorizing. Its strong grip on methodology in particular seems to have hindered the development of theories that take into account the cognition-relevant effects of alcohol in the explanation of alcohol-related violence. The relatively strong cognitive line of research on alcohol-related expectancies has neglected the psychophysiological effects of alcohol (including the effects on cognition) and based its explanations on social beliefs regarding the effects of alcohol; such

beliefs are assumed to act in the same way whether the individual is intoxicated or sober.

In the expectancy approach, different alcohol-related factors (the sight of a liquor bottle or a glass of mixed drink, the taste of the drink, the sensations associated with drinking, etc.) are seen as activating expectancies basically in a stimulus-response manner. Essentially, the stimulus-response paradigm views the drinker from "a sober point of view" in explaining his/her behavior. Stimuli are assumed to impinge on the passive subject in basically the same way whether he or she is sober or drunk. A more decisive break with this environmental control tradition will probably lead to more valid theoretical frameworks for drunken behavior. New frameworks will have to incorporate a more direct study of drunken cognition and phenomenal states and a keener eye on complicated interactional processes that unfortunately cannot be easily modeled in experimental paradigms.

A "sober perspective" is evident also in broad conceptualizations suggested by social researchers in the explanation of alcohol-related behavior (e.g., time-out, deviance disavowal, mythical drinking; see below). In these conceptual models, drinking occasions are managed in a rational sober frame, and the intoxicated person is seen as behaving according to social definitions or instrumental goals in the same manner as when sober. Let me exemplify with MacAndrew and Edgerton's (1969) explanation using the time-out concept and the related idea of alcohol use as a rationally planned means

for deviance disavowal. Clearly they explain drunken comportment from a sober viewpoint: The time-out definition and blaming alcohol for inappropriate behavior are learned by the members of the culture, and they apply it (as if they were sober) when they drink. No alcohol-related contingencies are specified that would, for instance, disrupt the application of these cognitive schemas.

Analyses of real-life occasions of drinking and aggression suggest that even a person under the influence of alcohol actively selects cues among (phenomenally) available cue assemblies and, with the help of these and the cognitive schemas that have been activated or that the drinker has actively selected, tries to orient him/herself in the situation and to act accordingly. The important point is that the drinker in large part has recourse to and makes use of cognitive schemas that are essentially the same as those that he or she uses in a sober state for orientation, action, and interaction (although a certain alcohol-influenced selection bias occurs above threshold levels of intoxication; see below). In all likelihood, most of the cognitive elements that guide behavior are not alcohol specific, although some probably are. Whether these alcohol-linked elements are social definitions of drinking occasions as time-out, or are permissive norms linked to alcohol use, different types of beverages, or different drinking settings, they cannot explain all the behavior and interaction occurring in drinking situations. Behavior and interaction in connection with drinking is not just based on alcohol-related cognitive

elements of these and other kinds. Instead, drinking-related behavior is predominantly based on the types of activities that the drinker takes part in, such as card playing, pool playing, dancing, discussing work-related problems, telling stories or jokes, watching TV, or observing the activities of other people. Such activities are not guided predominantly by alcohol-related expectancies, although the latter may enter as one type of factor determining behavior.

A systematic consideration of naturally evolving episodes of alcohol-related violence would probably bring about a greater regard for isomorphism between theory and the empirical processes that the theories are supposed to explain. Concepts such as alcohol-induced disinhibition, deviance disavowal, time-out definitions linked to alcohol use, and alcohol-linked expectancies, even if part of valid models of alcohol-related violence, tell us very little about the processes that link drinking to alcohol. These trait characteristics connected to alcohol somehow must be activated in order to exert a causal influence. And, as will be discussed below, this activation usually requires at least a minimum of cognitive processing.

Theories that are isomorphic to real-life processes would specify intervening processes in great enough detail to allow for several different types of alcohol-linked developments. These may hinder, cancel out, or reinforce other alcohol effects that increase the risk of aggression. To take a simple example, in the case of a well-specified disinhibition model, greater isomorphism could include a specification

of two necessary conditions for an elevated risk of disinhibitory processes. First, attentional processes have not been diminished below a certain threshold level. The target of disinhibited aggression must in some way be perceived as a minimally suitable target for achieving the emotional release presupposed by most disinhibition conceptualizations. Second, blood alcohol content (BAC) has not reached a critical level at which a physical attack is made impossible due to other effects of alcohol (such as sensorimotor debilitation). Requiring such specifications may seem like nitpicking, but leaving them out is part and parcel of simplified conceptualizations that block theoretical advances in the field.

Structuring the field of inquiry from the perspective of natural episodes of drinking and aggression events provides a conceptual focus not only on the individual and the workings of alcohol within the individual, but on the interactional implications of alcohol intoxication. The importance of interactional processes is evident from numerous studies of violent crime and has been noted by several seasoned students of criminal violence. In his classic study Wolfgang (1958) noted that half the homicides in Philadelphia either issued from seemingly minor conflicts (37 percent) or from domestic quarrels (13 percent). Ferracuti and Newman (1974) asserted this point in stating that "When one notes that a considerable amount of criminal homicide occurs as a result of trivial altercations between persons closely related to each other, one can see that even the smallest details of the

way people expect each other to act may be important to the understanding of violent crime" (p. 193). The fact that alcohol- and drug-related interactional changes may increase the risk of aggressive behavior has been noted even in studies of laboratory animals. Miczek and Thompson (1983) suggested that such findings have implications for the elicitation of drug-related aggression among humans and concluded: "Drug action on communication processes constitutes an important source for drug effects on aggression" (p. 168).

Semiotic Dimensions of Alcohol, Drinking, and Drunkenness

Alcohol has numerous semiotic dimensions in addition to its psychophysiological consequences. Explanatory frameworks based on these semiotic aspects have a legitimate place in a systematic accounting of alcohol-related behavior, including violence. Semiotic conceptualizations have been used, for instance, in the explanation of Finnish drunken comportment, where the concept "mythical drinking" has been coined to designate the deep, historically evolved semiotic structures of Finnish drinking behavior (e.g., Falk and Sulkunen 1980, 1981). The social meaning of drinking as signifying freedom, rebellion, or adulthood has often been suggested as an explanation of specific kinds of behavior, especially among young drinkers. The behavior explained is seen as *exemplifying* these very themes. This is not necessarily a tautological type of explanation, although the semiotic theme (e.g., freedom) and the

behavior (e.g., disregard for parental or generally adult normative shackles) are semantically linked. Symbolic dimensions are often based on observed or assumed effects of alcohol; thus alcohol use may become a symbol of "rebellious" behavior because it has been observed to induce such behavior under fairly common external conditions. Even in these cases, however, such social definitions will also independently determine the nature of drinking occasions and behavior on these occasions. To recap: Excessive forms of behavior may be facilitated by alcohol, and this will socially lead to semiotic constructions whereby alcohol use events in certain groups of drinkers will be designed to exhibit such themes.

Visible natural level effects of drinking on the individual may be semiotically transformed into characterizations or definitions of the person affected by alcohol. In this way they may determine interaction with an intoxicated person. The human face is a finely calibrated semiotic field with a strong impact on communication and interaction (Birdwhistell 1970). Thus nystagmus, difficulties in ocular tracking (Flom et al. 1977; Katoh 1988), alcohol's debilitating influence on sustained attention (e.g., Rohrbaugh et al. 1987), and the "dog" face look of the seriously alcohol-affected person (occasioned by psychomotor impairments) will have an impact on interaction. A person who has a sufficiently high level of alcohol in the blood will have "shifty" eyes, seem preoccupied with other matters than the interaction at hand, and fail to respond in expected and socially proscribed ways to interactional

overtures (Pernanen, in preparation). Most of the interactional rules discussed by Erving Goffman (e.g., 1963) are broken by sufficiently alcohol-affected persons. It seems likely that these breaches (and the negative attributions that they bring about from others) have an effect on the risk of conflict and aggression and the severity of aggressional outcomes via social attributions by other interactors. In some ways the intoxicated person has also become *dehumanized* through such outer signs of intoxication. Perhaps this can help explain some of the victimizations of drunken people, since dehumanization is considered by some theoreticians to be a means of enabling the serious victimization of another human being (e.g., Zimbardo, 1969). This is another aspect of the interactional semiotics of alcohol, drinking, and drunkenness that deserve scientific attention in the explanation of human alcohol-related conflict.

Alcohol-induced disturbances in semiotic dimensions of human interaction affect the elicitation of aggression and physical violence. If we change our conceptual outlook to accommodate these dimensions it becomes obvious that the determinant power of both purely alcohol-specific processes (such as disinhibition) and aggression-specific processes (such as expectancies linked to aggressive behavior after drinking) in the explanation of alcohol-related aggression is more limited than some traditional and current conceptual frameworks suggest.

There are several types of theories that explain intoxicated behavior on the basis of some aspect of general behavior

theory. However, they are typically vague and extremely general in their conceptualization of the explanatory task. Theories invoking time-out definitions, deviance disavowal, and different social meanings of alcohol and drinking do not specify the processes by which these social factors exert their influence. (Above I have assumed that this implies by default that the processes are considered the same as for sober behavior.) The conceptual frames that guide prevalent social explanations of alcohol-related behavior err too much in the direction of ignoring the biological and psychological effects of drinking. This is also true of the theoretical approach that treats various alcohol-related behavioral phenomena as caused by expectancies. Although the belief that one is drinking alcohol (although one is, in fact, drinking a nonalcoholic beverage) has been found to increase the likelihood of responding aggressively under common experimental conditions, these conditions differ in important respects from those present in drinking situations in which serious aggression has occurred. Most importantly, the BAC's found in victims of homicide are on the average six to seven times as great as the BAC's that can be used in expectancy experiments without giving away the beverage deception.³ Expectancy conceptualizations in all probability do not suffice in the large majority of instances of serious violence. At high levels of alcohol in the blood, a number of

psychophysiological effects of alcohol become more pronounced, while expectancy effects can hardly be assumed to become much stronger with increasing BAC's.

General Conceptual Frameworks and Their Overextensions

The conceptualizations that have been discussed to this point are of relatively low generality. There are others that potentially cover all attempts at explaining human behavior. These are the explanatory "metaschemas" of natural-level causality and adaptive goal directedness, or teleology. We all share in these explanatory possibilities by having been socialized into Western culture. They are a very general part of our conceptual framework for understanding empirical phenomena and have shown their usefulness. However, like all explanatory paradigms, they also have been grossly overextended at times to the detriment of scientific advance. The corrective process, which tests the limits for such general conceptualizations, is primarily one of trial and error since broad conceptual frames do not in themselves contain specifications as to limits of applicability.⁴

We may argue about the aspects of alcohol and the alcohol-linked processes through which different kinds of alcohol-related behavior occur, but simple observation cannot fail to convince us that at certain threshold levels alcohol begins to have effects on behavior that are unin-

³ Compare for example the BAC's used experimentally (see, e.g., Collins and Searles 1988) with those found in the victims of homicides reported by Goodman et al. (1986) and Virkkunen (1974).

⁴ In the most brazen overextensions both the inanimately causal and the teleological explanatory schemes have been applied by philosophers to explain all empirical occurrences in the world.

tended by the drinker. These drinking-related consequences can be predicted without knowing the psychological and phenomenal events taking place in the drinker. Probably the clearest examples of such effects are alcohol-related sensorimotor disturbances. No one can deny in earnest that this aspect of behavior is caused by the chemical properties of alcohol and the physiological processes in which they are active. On the other hand, even at high levels of alcohol in the blood, the drinker exhibits at least some purposive goal-directed activity, be it as simple as trying to find his or her way out of a room. The contrast between the apparently goal-directed (and "guided") activities and the "foreign" determination through causal processes (or "powers") beyond the drinker's conscious control leads us to perceive the drinker's behavior ambiguously or as oscillating between the categories of naturally caused and humanly guided behavior (Pernanen 1991).

The explanatory structurings of natural-level causality and adaptive, cognitively mediated guidedness are generally considered to be logically exclusive. Empirical phenomena are regarded as explicable by one approach or the other. This preconception makes it hard to integrate them in the same explanatory structures, although both types of determination seem to mix unproblematically in individual instances of behavior. Behavior affected by a pharmacological agent is a particularly transparent case of "mixed" determination. The logical tension between two explanatory master frames is evident in the mutual exclusiveness of

social and pharmacological or physiological explanations of drunken behavior.

Mechanistic overextensions

There are obvious overextensions of the naturally causal metaparadigm. They are especially prevalent in explanations of behavior that is obviously influenced by a psychoactive substance. The way in which natural cause ideas sometimes achieve an undeserved hegemony at the expense of explanations invoking teleological guidedness can be exemplified with two rather popular concepts in the study of drunken behavior mentioned earlier. In the context of aggression, alcohol's presumed role(s) as a disinhibitor or catalyst of aggression is widely viewed as a meaningful and legitimate explanation. (These roles are also used to explain other excessive or hazardous types of behavior after drinking.) Alcohol as a catalyst of aggression is perhaps the more transparently naturally causal of the two, since it refers directly to a type of chemical reaction that (by some type of analogy) is used to explain alcohol-related aggression. However, disinhibition also has a definite mechanistic bias; when this explanation is used there are typically no provisions made or openings left for input through guided or cognitive processes.

It is often overlooked that disinhibition is basically a *formal* concept.⁵ To "disinhibit" is loosely synonymous with to "release," "unblock," or "liberate." Such concepts can be applied to any type of process or empirical occurrence. That the conceptual pair of inhibition-disinhibition is a formal tool in explanation is

acknowledged in standard dictionary definitions. It is explicitly defined formally in behavioristic psychology. The *American Collegiate Dictionary* from the year 1958 defines the meaning of "inhibition" within psychology as "the blocking of any psychological process by another psychological process," and *Webster's Encyclopedic Unabridged Dictionary* from the year 1989 uses almost exactly the same words, while defining "disinhibition" as "a temporary loss of inhibition, caused by an outside, often unrelated stimulus." The inhibition concept is used to describe such occurrences in any type of process, for instance, in brain physiology when one physiological process blocks another. This, of course, shows that "disinhibition" does not refer to any specific empirical process and that it can be applied to any number of different processes in different fields of empirical study. Still, we are tempted to look beyond the formal use for a specific type of causal process as *the* meaning of such concepts.

Formal concepts have a nonreferential status, and we are easily led astray if we start looking for a concrete reference for them in the form of a specific causal process or attribute. This has occurred with "disinhibition" as it is used in the explanation of behavior after drinking. It

has acquired substantive meanings, which are used parallel to its basic formal meaning. The most common of these refers to a process in which alcohol first acts on the higher brain centers and releases the lower brain centers from their control, thereby changing behavior. This type of model was cautiously suggested by Newman (1941), but later statements by other writers became progressively less cautious and more categorical. The wide formal applicability of the disinhibition concept may have been mistaken as general support for the existence of specific disinhibition processes. However, serious students of aggressive behavior in the biological sciences speak much less openly about disinhibition processes as causes of drunken behavior (as has been pointed out by Woods and Mansfield 1983), while representatives of behavioral sciences have tended to locate them in brain physiology. Because the concept is formal in nature, allowing it to be used in any number of empirical contexts, it is also well equipped to be overextended. Since it is basically of a mechanistic nature (it does not imply any goal direction or adaptive cognitive guidedness), its use tends to overextend natural causal explanations to areas of human behavior in which concept and theory formation based on

⁵ Other examples of formal concepts are "cause" and "function" (as used, for instance, in functional analysis of human behavior). "Cause" is defined through satisfying the procedures that we institute to establish causality: (1) covariation between presumed cause and effect, (2) the presumed cause precedes the effect in time, (3) no third factor exists that would account for the covariation. The tendency is strong, however, to equate the meaning of a concept with reference to some easily recognizable entity and to view any concept as referring to something concrete (which is being "named" by using the concept). This sometimes leads to attempts at finding the meaning of "cause" by analyzing concrete images, such as billiard ball A (the cause) colliding with billiard ball B and setting it in motion (the effect), in order to find the concrete referent and essential meaning of the cause concept.

human guidedness would better serve explanatory purposes.

A prevalent use of "disinhibition" is to let the concept stand for *counternormative* behavior. However, "alcohol leads to disinhibition" in this case means the same as "alcohol leads to disinhibited behavior"—we have only made an empirical generalization. The sentence states that behavior which was somehow inhibited in a sober state is more commonly displayed after drinking. It does not tell us anything about the causal processes whereby this occurs. In fact all of the explanations put forth in this paper could be such disinhibition processes. Taylor and Leonard (1983) quite legitimately use the term "learned disinhibition" for models using alcohol-related expectancies to explain alcohol-related aggression. The relationships and processes that are potentially covered under the formal uses of "disinhibition" and the extended use of "catalysis" include consciously or subconsciously guided ones in addition to natural causal processes. This means that when we call alcohol a disinhibitor of aggressive behavior, we have actually stated something that is much less specific than is commonly assumed, and the same applies to other formal concepts (for details see Pernanen, in preparation).

Most of the time it is difficult to judge how far-reaching the claims of explanatory coverage are when a model is used to explain alcohol-related behavior (or, for that matter, when any model is used to explain any type of behavior). To what extent is alcohol-induced disinhibition, for instance, meant to be a purely "urge"-

driven model, so that no matter what the stimulus assembly faced by the drinker, he or she will be more likely to aggress after drinking than when sober? Or is such a model to some extent meant to be environmentally controlled, or stimulus driven, so that disinhibition will only occur when the drinker encounters frustrating, threatening, or provocative stimuli, which have been found to interact with drinking in elevating the risk of aggression? Do we have to posit perceptual and attentional thresholds for such stimuli to be registered by the drinker and lead to disinhibition, and in this way acknowledge at least a minimum level of cognitive mediation? If the answer to the last question is yes, then any perceptual and attentional effects that alcohol may have will affect the likelihood of disinhibition, and we will have to build integrative models that take into account both alcohol-induced disinhibition and alcohol-related changes in cognitive processing. Researchers' answers to such questions probably vary depending on the type of disinhibition explanations they use. However, because these matters are not often discussed, the only recourse left is to use a default interpretation stating that because contingent factors are not mentioned they are apparently considered irrelevant by the writer.

Owing to obvious limitations on time, money, scientific expertise, and availability of subjects, all of the variables that potentially affect the relationship between alcohol use and aggression cannot be included in one study. In seeking valid models that explain the alcohol-violence link we have to use a "black box strategy"

where we shift the position of our hidden assumptions and boundary conditions from one study to the next. No one likes to have his or her field of expertise or favorite set of variables put in the black box and disregarded. But in implementing this strategy, note that the position of the box in any particular study is based on an arbitrary decision when viewed from the larger context of phenomena that occur in the freely evolving world and that the necessary balance may be achieved by shifting the black box to other positions in other studies. A systematic black box strategy combined with thorough conceptual and theoretical analyses and integrative attempts may create a useful research strategy. Over the course of time this approach will hopefully reveal which explanations are mutually incompatible, which ones point to causal processes that occur only in specific subpopulations and cannot be generalized to others, which processes may occur at different points in the same causal sequence, which processes point to alternative causal pathways linking alcohol use with aggression, and so on.

Guided overextensions

There are substantial overextensions of teleological conceptualizations in social theories that try to explain drunken comportment. Social definitions of drinking situations as "time-out" occasions or situations suited for exhibiting the social-behavioral theme of "freedom," "rebellion," or "manliness," or the planned use of alcohol and social expectations linked to it as an excuse for violence, can only partially explain the violence that

occurs after drinking. Nevertheless, these explanations are frequently put forth as the only alternative to explanations that use natural-level processes to account for aggressive behavior after drinking. However, when such social factors are active in causing violent behavior after drinking, they probably interact with a number of other factors, some of which are direct outcomes of the psychopharmacological actions of alcohol. As with the naturally causal models, the overextensions are not necessarily based on the intentions of the original author. The explanations may instead have been applied in an extended way by others, because explanations easily give rise to wide default interpretations if other factors and processes are not mentioned.

Teleological explanations were perhaps more prevalent during earlier periods in history, but strong teleological tendencies still exist in popular explanations even of inanimate phenomena. They are in fact inherent in the nature of our language. Human language is anthropocentric and contains implicit guided structurings, no doubt because it has evolved as part of human action and is still used predominantly to refer to self and others in action. This naturally has important consequences for the explanation of any phenomena. An excellent illustration of the explanatory power of thematic "scripts" in language is presented by Gillian Beer (1985) in her analysis of the explicit and implicit explanatory structures in Charles Darwin's *The Origin of Species*.⁶ The anthropocentric nature of human concepts posed problems for

Darwin (and other natural scientists) who tried to render basically mechanistic or inanimate occurrences without any guided intention or goal directedness. This linguistic tendency was very clear to Darwin, who wrestled with it, trying to neutralize it and to communicate the "metamechanistic" nature of natural selection. He changed his phraseology from one edition of his major work to the next in an attempt to avoid the guided implications inherent in the very word "selection."

Scriptlike explanations are an integral part of human thinking and, because they are so central in the successful conduct of everyday life, probably are one of the first types of explanation we (over)learn. This teleological tendency in language and thinking is, for obvious reasons, not as problematic in the explanation of human behavior as it is when applied to inanimate processes. However, when combined with the influence of a chemical agent such as alcohol it may easily bring forth an explanatory frame wherein the chemical agent triggers behavior that follows a specific script. There are some dangers of excessive simplification implicit in "humanizing" the causal processes behind alcohol-related aggression in this way.

Illustrations can be found of scriptlike depictions of even the pharmacological determination of behavior under alcohol intoxication. The belief of Native Americans that drunken behavior was caused by foreign spirits (MacAndrew and

Edgerton 1969) is a case in point. This is perhaps to be expected in societies where animistic explanation is a common way of making sense of the world and trying to control it. Note, however, also the English designation of alcohol as "spirits" and expressions such as "the devil in the bottle" and "demon rum" that were used by temperance advocates to imply that animistic scripts corresponding to such designations could be expected from drinking (including savagely violent behavior). In addition, in ancient times the intoxicated person was at times depicted as a different kind of animal for various stages of intoxication (lamb, monkey, lion, pig). Likewise, according to MacAndrew and Edgerton (1969), the 16th century writer Thomas Nash listed "eight kinds of drunkenness"; seven of these referred to various species of animals. A lion-like phase of intoxication represents an irritable or aggressive (perhaps "roaring drunk") type of drunkenness. Such depictions introduce a form of scriptlike explanation by analogy.

Violence-specific conceptual tendencies

The very salience of violence that is culturally determined and institutionally upheld (by the police, courts, and news media) probably blocks valid explanations in the study of alcohol-related violence and aggression. The power of physical violence to catch our attention and hold our minds is evident from its popularity

⁶ *Scripts are sequences of goal-directed behaviors that have a definite theme and lead to a specific goal. As defined by Nisbett and Ross (1980), they are "event sequences extended over time, and the relationships have a distinctly causal flavor, that is, early events in the sequence produce or at least 'enable' the occurrence of later events" (p. 34).*

in both fictional and documentary accounts of human behavior. Violence structures episodes, human character, social environments, and even our view of human lives. As with all descriptions of human (and to some extent animal) behavior, there is a conceptual pressure toward thematic closure, noticeable in the construction of scripts, to make preceding factors lead up to the end result. (Thus the manner in which people die, especially if this occurs in a dramatic fashion, will sometimes in retrospect end up characterizing their entire lives as if everything had led up to this final outcome.)

As a powerful theme, violence structures descriptions of episodes in which it has occurred, so that other information which does not fit this consequential theme easily gets screened out. It seems possible that thematic screening of this kind helps explain why alcohol-related affiliative and aggressive behavior is seldom studied within the same research project.

A Strategy for Some Theoretical Conceptualizations: Getting to the Processes Behind All the Labels

In the explanation of alcohol-related behavior there is a great deal of (largely unanalyzed) overlap between common concepts referring to presumed mediating

processes. There is thus a certain amount of redundancy in concept formation. We usually do not look further for something that these concepts may have in common, in order to halt the proliferation of processes that mediate between drinking and aggressive behavior. However, even a superficial conceptual analysis shows that in many of the situations in which an alcohol-related episode of violence has been attributed to "impaired judgment," for example, it can just as well be ascribed to "risk taking," "euphoria," or some type of "disinhibition." For nomothetic causal explanations it does not suffice to merely note that such concepts overlap; we must try to see *how* the concepts overlap and *how* they are related. In order to succeed at this it is helpful to acknowledge the contextuality of language and to apply a relativistic strategy in conceptualizing mediating processes.⁷

In the language of both the layman and the researcher, many causal factors related to specific behaviors get their linguistic labels depending mainly on behavioral effects displayed *within specific situations*. With situations involving human actors (and also when humans observe animals), the observer's requirements for successful or correct behavior provide the basis for classifying the behav-

⁷ The term "relativistic" is not meant here to imply that we need to take a relativistic epistemological view, such as that propounded by Rorty (1991). Such a philosophical stance would be counterproductive to what I propose here: to cut through the number of semantic designators that describe the outcomes of the same empirical process from different vantage points. This seems to me the exact opposite of a relativistic epistemological view. However, my suggestion is roughly in line with the way Albert Einstein showed that even apparently invariant phenomena are different depending on the position of the observer in space-time. In the relativistic strategy that I propose, we examine the implications of the fact that many of our concepts get their meaning in part from a situational context and that they are anthropocentrically defined from the actor's point of view.

for tendencies or capabilities displayed and required. In experimental research, including studies that measure alcohol effects, these situational requirements are very explicitly stated by the experimenter who instructs the subjects about what task they are to perform. Labeling situations, skills, and capabilities on the basis of perceived task requirements is a central aspect of human existence, and a great number of concepts are available for this purpose.

When we suggest, for instance, that someone is exercising good judgment or is taking risks (or, showing the psychological trait of risk taking), we are not using language in the same way as when we state that there is a table in the middle of the room. When we accuse someone of showing impaired judgment caused by drinking, we do not simply refer to an attribute of his mental capacities. Instead, a whole scenario is implicitly rolled out, and only in the context of this scenario do these words have the meaning we intend them to have. Part of the very meaning of trait words such as "impaired judgment" and "risk taking" are criteria for the adequate performance of a task faced by the actor on whom we pass judgment. Success at this task can be a question of solving a problem, maximizing winnings in a game, driving a car, or teaching another person a list of words. If the subject selects a successful course of action or performs a task appropriately, we say that his or her judgment or judgmental ability was good. If failure results, we say that his or her judgment was bad, impaired, or defective. The criteria for attributing such an ability or faculty to the subject are based on the sit-

uational requirements that we perceive or, in an experimental situation, requirements that we have defined, as well as the behavior itself.

Due to the conceptual overlap and the nearly unlimited possibilities of labeling situational task requirements, the processes or traits that mediate between drinking and aggressive behavior can be multiplied indefinitely. Traits have their linguistic representation as *nouns*, and this easily stunts theoretical development. As we have seen above, this linguistic form makes it seem as if a term ("judgment," "risk taking," "attention") unproblematically refers to a specific entity in the same manner as do many other nouns, often independent of contextual criteria. In order to include situational variations in their meaning, it is more accurate to treat such concepts as referring to *processes* that in specific types of situations with a specific type of task stipulation lead to a behavioral outcome that can be designated as "good judgment." In this way it may be relatively easy to bypass the proliferation of trait concepts and get closer to the true empirical loci of constancy and variability.

If we free ourselves of absolutist conceptual circumscriptions (more useful in empirical contexts than in theoretical endeavors), we may find that phenomena which seem categorically dissimilar may be accounted for by essentially the same alcohol-induced processes. Thus such phenomena as "lack of judgment" (with strong trait connotations), general affectivity, risk taking, subjective experience of time duration, impulsiveness, some cognitive characteristics of alcoholics, the char-

acteristics of relatively successful treatments of alcoholism, and aggression may in part be accounted for by essentially the same alcohol-induced processes. The same basic alcohol effects may explain increases in both positive and negative affect, the phenomenon of drinking to "forget" (escape drinking) or "drown one's sorrows," and help account for some phenomena that are essentially sociocultural in nature. In the latter case the effects of alcohol-linked processes may have been semiotically transformed into definitions and beliefs that may on the surface have nothing to do with individual level outcomes of drinking. The determinant processes underlying different characteristics of behavior, affect, beliefs, and social norms could be largely identical and have mainly situational contingencies and orientational requirements or task demands in common with the labels used in the numerous empirical generalizations regarding effects of alcohol. Situational contingencies and related task demands then determine the labels we assign to the resultant effects of alcohol use and the traits ascribed to the intoxicated person.

To regard situationally grounded trait constructs as stable faculties impedes theoretical extensions needed in constructing more inclusive theories of alcohol-related behavior. As long as we remember that a faculty or trait concept created through this type of trait-defining conceptual process ought only to have a provisional theoretical status (perhaps descriptive of a conglomerate of person-requirement-response values), this common absolutist strategy makes it easier to orient ourselves

in the void between theory and operationalizations. However, we should not overlook the need to translate back to a more relativistic mode of expression that acknowledges the contextuality of central concepts. For instance, what from a trait perspective is "poor impulse control" is also a tendency toward greater determination by situational factors. Similarly the trait concept of "irritability" may perhaps profitably be viewed as part of a general predilection to be guided by fewer or less significant behavior cues ("trifles"). With this type of translation, scientific questioning shifts rather effortlessly to inquiring about the nature of the *process* that brings about such action tendencies as well as the nature of relevant situational factors.

In summary, conceptualizations that acknowledge the contextual dependence of key concepts recognize that *the same mediating processes* may be behind what are usually referred to as different traits; the same alcohol effect may be labeled differently depending on variations in the requisites posed by the task at hand. In fact, such basic effects of alcohol have been discussed in the alcohol literature for several decades under the label of information processing, although the impairments found have not been systematically applied in theories of alcohol-related behavioral phenomena. Instead, the implications drawn from inferred effects of alcohol on human information processing have remained firmly at the relatively simple perception or response level (e.g., reaction time, sustained or divided attention, eye movements) and have not been extended to what they mean for

human orientation, action, and interaction. Such extensions, while still speculative, have heuristic value in bringing together several seemingly disparate phenomena related to the use of alcohol.

COGNITIVE MODELS AND THEORETICAL INTEGRATION

There are numerous studies showing the effects of even relatively small amounts of alcohol on human attention and perception. There is perhaps not as much directly relevant data available on the later, more interpretive stages of information processing after drinking. However, there is enough for integrative attempts.

Taking the dynamics of human interaction and cognitive orientation that one typically finds in groups of drinking individuals as a starting point, it is difficult to understand how the effects of alcohol that have an impact on the drinkers' attention, perception, and more central cognitive processes can be ignored in the explanation of alcohol-related behavior. Even in the conceptualizations that acknowledge a bare minimum of environmental input in the processes that cause the drinker to behave aggressively, there must surely be an opening for the changes that alcohol's effects on perception and attention have in bringing about interpersonal violence. When we speak of stimuli and cues for aggression, the importance of setting (e.g., Pliner and Cappell 1974; Russell and Mehrabian 1975), or other situational factors in increasing the likelihood of aggression, we imply at least a minimum of cognitive awareness—the situational factors have to be somehow registered by the

drinker. In the words of Bandura (1978): "External influences operate largely through cognitive processes" (p. 355).

The importance of alcohol's effects on the mind is acknowledged by the numerous studies carried out on this aspect of alcohol intoxication. In summarizing research almost two decades ago, Levine and his colleagues (1975) screened 179 experimental tasks originally found in the literature for methodology and care of reporting. They found that 60 percent of the 41 experimental tasks studied under alcohol use conditions were predominantly cognitive in nature, 24 percent belonged in the perceptual sensory domain (thus also being "cognitive" in a more general sense), and 16 percent in the psychomotor domain. Furthermore, the investigators found that fully 44 percent of the experiments were classifiable as selective (divided) attention tasks, and that of the three categories, these showed the most serious decrement after alcohol use.

The relevance of cognitive changes caused by alcohol for interactional and semiotic behavior dimensions has hardly been explored at all. Instead the findings have been applied mainly to very specific technical tasks encountered in daily life, such as tasks that are part of driving a car. However, recognition that cognition effects are of central importance recently has been extended to explaining alcohol-related aggression (Hull 1981; Pernanen 1976; Steele and Josephs 1990; Taylor and Leonard 1983). Nevertheless, much remains to be done in the semiotic-interactional area of intoxicated behavior determination. Pertinent research could

be carried out, for instance, within a symbolic interactionist theoretical frame.

There are numerous ways in which what is known about alcohol's cognitive effects can be relevant in explanations of drunken comportment. Some results of the studies that I have carried out on episodes of aggression in natural situations indicate that alcohol has a central role in the elicitation of conflict (Pernanen 1991). In an attempt to explain the elicitation of some alcohol-related aggression, I will suggest here a model that tries to integrate some findings on attentional and other cognitive deficits under alcohol's influence with situational and sociocultural factors.⁸ Throughout the reasoning below I adhere to the assumption, described earlier, that the drinker tries to actively adjust to a changing situation by applying the same cognitive schemas that he or she uses in sober life. However, some central cognitive parameters have changed. This leads to a depletion in the number of schemas available for preventing confusion and indecision and for achieving meaningful cognitive structure and cognitive control and to some changes also in the way cognitive schemas are applied in order to "define the situation."

It should also be pointed out that the processes outlined below interact with other types of alcohol-related and alcohol-unrelated processes. It seems very likely that expectancies linked to drinking also will be active in a proportion of these inci-

dents, especially at low BACs. However, the main orientation of drinkers (and the salience of cues that activate expectancies) on most drinking occasions will be determined by factors that have very little to do with the cue value of alcohol in a bottle, in the drinker, or in the act of imbibing. In this regard, drinking occasions differ greatly among themselves, but expectancy experiments are probably atypical in the central role that they accord to alcohol-linked cues. I suggest that it is more often the cue, thought, or interpretation that another man is trying to steal his girlfriend or bumping into him (and the expectancies linked to these phenomena) that is decisive in determining the drinker's violent behavior than external or internal cues linked to alcohol. Alcohol may, through its effects on cognition, increase the likelihood of such interpretations. The most common cognitive links between drinking and aggression are probably neither as alcohol specific nor aggression specific as expectancy theories would have it.

An Illustration of Theoretical Integration

Several experiments have shown the difficulty in performing more than one attentional task after drinking (e.g., Huntley 1974; Moskowitz 1984; Moskowitz and DePry 1968; Moskowitz and Sharma 1974). Because of the difficulties with dividing attention between two (or more) sources of cues, intoxicated individuals

⁸ This model is an extended and somewhat revised version of a model that I put forth earlier for the explanation of alcohol-related behavior, including aggression (Pernanen 1976). Since then there have been other attempts at explaining alcohol-related aggression from the same basic changes that alcohol causes in the drinker's cognitive performance (e.g., Steele and Josephs 1990; Taylor and Leonard 1983).

tend to select, actively or by default, only one of them to guide their actions. The choice is made predominantly in favor of the most salient, vivid, or effortlessly cognized cues (this circumstance has been used by Taylor and Leonard (1983) in constructing their cognition-based model for alcohol-related aggression). From these facts, some characteristics of drunken orientation can be deduced. Designated as traits, they could be labeled "situationality" and "simplicity" (Pernanen 1991, in preparation). The latter label refers to the fact that fewer cognitive elements (particularly cues in the external environment, but also cognitive schemas, inference rules, and the like) are activated under alcohol intoxication, and therefore the assembly of cognitive material at the disposal of the drinker is smaller than that of the sober person. This by itself can explain some aspects of drunken conduct. One of these is that intoxicated individuals perceive the world, the immediate situation, and the persons they are interacting with in a simplified manner or, in Broadbent's (1971) terminology, there is more "pigeonholing" of incoming stimuli. There may also be overuse of overlearned, for example, stereotypical, attributions to occurrences, persons, and situations.

The other aspect of drunken orientation, situationality, is directly derivable from empirical findings in divided attention research, with one additional, seemingly plausible premise. Under the assumption that what takes place in the immediate situation is more salient or vivid than phenomena for which there are

no cues available in the immediate situation, it can be concluded that the drunken individual's behavior will be lopsidedly determined by situational factors, the "here and now." (There are a few anecdotal references to this characteristic in the literature, but on the whole this aspect and its implications have not received much attention.) One consequence of this is that disproportionately nonsituational cues based on memory retrieval capacity, also found to suffer independently under alcohol (e.g., Williams and Rundell 1984), such as normative rules, will be shunted out of focus after drinking.

To briefly illustrate the potential relevance of these alcohol effects, I suggest that the processes described here explain part of the excessive, risk-taking, indiscriminate, and aggressive behavior that occurs in connection with drinking, especially communal drinking situations. The reasoning is as follows. The drinker's basic need to orient the self in the situation and fulfill its perceived task requirements remains active even after drinking, while the means for accomplishing this have been reduced due to simplification and situationality. Just like the sober person, the intoxicated person needs some cognitive schemas for the purpose of orientation and action. However, the selection will tend toward schemas that are simple and overlearned and those for which the immediate situation provides cues. One such simple, widely used, and overlearned schema for structuring social situations is relative social status. Status of course is an important part of human self-esteem and identity. Therefore, it is

likely that humans after drinking develop a more situational identity.

This conceptualization points toward some interesting theoretical and empirical directions. For example, Anderson (1978) suggested that some taverns are identity-defining forums. Several authors have commented on the symbolic egalitarianism implied in taking a drink together, and others have described taverns and bars as bulwarks of equality between patrons. This could be due to the fact that cues for stable and institutionalized status distinctions are generally not available in taverns and bars, which have rather uniform layouts and props for indicating status on display (e.g., tables and chairs and waiter deference). Consequently, one patron is not visibly ranked above another in terms of situationally available criteria. The situational cues tend toward equality, and nonsituational criteria for status distinctions have been pushed out of the drinker's focus through alcohol's effects on divided attention (and, more generally, on his or her information processing capacity). In this way alcohol's effects toward situationality and simplicity could have semiotic consequences for labeling drinking places as egalitarian locales.

However, this is only part of the story. The striving toward orientation and attempts at finding simple structurings of the immediate situation also mean a certain push toward status distinctions within the situation. No doubt this occurs more among some individuals and in

some locales than others. The situational determination of cognition and behavior means that status criteria will have a content that differs from sober conditions: Criteria for status distinctions are sought in the immediate situation. The drinker, who usually is a male, can assert such distinctions through his own behavior by grand gestures, such as insisting on paying for drinks, buying rounds, or displaying money or physical prowess, or can try to do so through competitive behavior at the pool table or by trying to pick up the most desirable mate available in the establishment. Such status-defining criteria have a higher relative salience and importance after drinking than in sober conditions; they *mean* much more to a person under the influence of alcohol. The drinker (especially one in an egalitarian setting) cannot as easily fall back upon his standing in the community or his past accomplishments. Sometimes he tries, and this results in the relative increase in bragging, shameless showing off, and verbal fencing that can be observed among groups of drinkers. Situational affronts to status also have greater importance for identity, and this is one way in which drinking and situational identity can play a role in instigating aggressive behavior. Challenges, acceptance of challenges, and resulting risky behavior are other outcomes of lopsidedly situational determination of status and identity.⁹

Alcohol has effects other than situationality and simplicity that are relevant

⁹ *Alcohol-linked expectancies certainly help define the drinking place as an egalitarian setting. However, they interact and compete with other expectancies linked to many aspects of set, setting, and interactional dynamics that are not related to the cue values and beliefs associated with alcohol.*

for the drinker's cognitive orientation and behavior. The sensorimotor effects of alcohol too have a great impact on individual behavior and social interaction. The beliefs and expectancies linked to alcohol strongly affect behavior, especially in the early stages of drinking. Even the characteristics of situationality and simplicity can predict a greater likelihood of other types of cognitive structurings than those based on status distinctions, such as schemas linked to amorous behavior. My intention has only been to show that a relativistic stance with regard to central explanatory uses of trait concepts and a preference for process over trait labels, a dynamic orientational view of the drinker as an acting subject, and an integration of social facts with physiological and psychological processes elicited or influenced by alcohol will probably lead in more fruitful directions than the prolific use of absolutist trait labels and reasoning along strict lines drawn by academic disciplines. By transcending such lines we will arrive at more valid causal attributions in the explanation of intoxicated behavior, including an important behavioral subcategory, alcohol-related aggression.

METHODOLOGICAL CONSIDERATIONS AND FUTURE RESEARCH POSSIBILITIES

This section identifies gaps and interesting possibilities in the study of alcohol-related aggression as well as approaches that I have found useful in my own research. I have already suggested that we ought to strive more to take "the drunken point of view" in our theorizing and empirical

methodology; study real-life dynamics, especially in the early stages of conceptualization; and employ a sequential and dynamic view focused on intoxicated social interaction. It is shortsighted both to apply stationary models to phenomena that are dynamic and orientational and to focus exclusively on the individual in isolation, when much of alcohol-related aggression is elicited through human interaction.

Social Research Approaches

A primary step in trying to explain any empirical relationship in human behavior is to gain a firsthand knowledge of the phenomena involved. There are proven methods for conceptualization or reconceptualization (paradigm shattering, "framebusting," "defamiliarizing"), the most reliable of which is the direct observation of natural episodes of alcohol-related behavior and, to a lesser extent, the reading of descriptions or "accounts" of these. In such a strategy, one almost inevitably adopts a cognitive stance that is different from that of controlled studies or quantified analyses of aggregated data. In my own case, ideas regarding the persistent attempts at cognitive orientation by the intoxicated person and the importance of social interaction in the elicitation of alcohol-related aggression stem largely from observations of intoxicated behavior in taverns and bars. In such "open-ended" confrontations with empirical phenomena, one is forced to abandon the concept of the intoxicated individual as a person isolated from a social environment and as a mere object of natural-level effects of alcohol. Such a "soft" method-

ology could be applied systematically in the study of drunken comportment in different subpopulations, locations, and (sub)cultures.

Different types of episodes of aggression need to be studied. They should include both violent crime incidents and episodes sampled from general populations. (Victimization surveys with a few changes in present sets of questions could be valuable sources of information on the involvement of alcohol in violence episodes.) Besides events in which physical violence was used, episodes of anger, threats, and other types of nonphysical aggression may provide important clues in the study of the elicitation, escalation, and deescalation of conflict, anger, and aggression in connection with drinking.

In the quantitative study of natural episodes of violence there are still important areas that seem virtually untouched. We do not know how drinking ranks in its influence in comparison with other causal factors. Additional background data are needed on the participants and on situational factors that may have contributed to the (type of) violence or aggression that ensued. For the purpose of specifying causal processes that link drinking with aggressive behavior, such information is a valuable first step. Before we can get a valid picture of the processes mediating between alcohol use and an elevated risk of aggression and violence, we must try to find out the importance of drinking by the participants in causing conflict, aggression, physical violence, and injury compared to the effects of other characteristics of the aggressor, the victim, and the setting.

I will illustrate these last points with some findings from my research on the connections between alcohol use and aggressive behavior. The empirical material is taken from an interview survey carried out in a Canadian city and subsequently replicated in Sweden. Data were collected on episodes of different types of aggression, including violence and threats of violence. Drinking by the adversary and the respondent (the victim) in these situations were key factors in the analyses. In addition, a number of situational and background variables were introduced into logistic regression models in order to measure their effect on types of violent acts, the victim's feelings of danger to life and limb, and actual injuries sustained. Alcohol did not have a significant effect on the choice of any of six different types of violent acts (slapping, grabbing/pushing/shoving, throwing of objects, punching with a fist, kicking, and hitting with a weapon or an object). In ranking the different independent variables according to their determinant power, it was found that drinking by the attacker and by the respondent/victim was consistently weaker in influence than were the effects of some common background factors of the two adversaries (Pernanen 1991). The most important determinant was the gender of the victim. The attacker, whether sober or drunk, in this sample of episodes of everyday violence, "calibrated" his or her violent actions on the basis of whether the victim was male or female. Gender of the attacker, the familiarity of the assailant to the victim, and even the location of the episode were also more

important than drinking in determining the type of violent act perpetrated by the assailant. A similar pattern emerged in regard to injury to the victim with the following determinants as the strongest: the familiarity of the assailant, the gender of the assailant, the gender of the victim, and the age of the assailant. Effects of drinking by the assailant (and the victim) were not statistically significant.

For situations in which respondents had been threatened with physical violence without violence actually ensuing, respondents were asked about their feelings of danger to life and danger of "getting hurt." Alcohol use by the threatener was of much greater relative importance in this assessment than was alcohol use by the assailant in actual violence and resulting injury (Pernanen in preparation). Still, the nature of the threat (especially if it was a threat of killing the respondent) overshadowed both the effects of drinking and the external characteristics of the threatener and the target of threats. For instance, the nature of the threat was more important in determining fear of getting killed or injured than was the fact that the threatener had been drinking. Alcohol use was also central in the victim's view of what circumstances or reactions on the part of the intended victims stopped threat incidents from leading to actual violence against them. In summary, the assailant's alcohol use had its strongest effects on the victim's subjective assessments of the situation and its outcome. This effect was much stronger than its actual influence on the assailant's choice of violent acts or the risk of injury to the victim.

Descriptive data provide added analytical dimensions when replicated under new conditions. This is true for general population studies of the kind that I have described here. The lack of significant alcohol effects in determining different types of acts has held up in the data from the Swedish community. On the other hand, drinking by the victim in Sweden was positively related to the risk of injuries sustained (on the 0.01 level of significance). In the Canadian community the fact that the victim was well known to the assailant (most often a member of the same family) strongly decreased the risk of injury, while it had no effect in Swedish violence. There were also great variations in the demographic characteristics that influenced feelings of danger to life and limb in threat episodes, with young victims and male victims of threats reporting that they felt much more in danger in Sweden than in Canada. In addition, patterns of intervention by bystanders in violence episodes showed interesting differences. There is no reason here to describe the findings in any more detail. The results indicate that replicative analyses of aggression episodes in different populations are needed in order to prevent hasty generalizations.

Some Psychological Approaches

In keeping with the conceptualizations suggested in an earlier section regarding the study of processes mediating between alcohol use and violence/aggression, and ideas presented in the preceding section regarding the necessity to take alcohol-related cognitive changes into account, I

will make some suggestions regarding possible experimental research in psychology.

Accepting more input from real-life sequences of drunken behavior and interaction means taking a dynamic view of behavior under the influence of alcohol, including alcohol-related excessive behaviors of all kinds. In order to study intoxicated orientational and interactional dynamics one needs experimental paradigms in which subjects are allowed greater freedom in choosing among cognitive schemas and behavior cues made available for structuring a situation, that is, studies which allow changes in "the definition of the situation" (e.g., a free choice between antagonistic and affiliative structurings). Such studies might ascertain whether intoxicated persons persevere in their cognitive structuring more than sober people (as anecdotal information on drunken attacks of jealousy would seem to indicate), or if individuals under alcohol's influence are more distractable (as other evidence would seem to suggest). Both of these hypotheses might be true but under different predispositional and environmental contingencies.

Studies should focus on relatively early stages in the processes that mediate between drinking and aggressive behavior and on the selection of cues and cognitive schemas in *cognitively more ambiguous situations* under alcohol and nonalcohol conditions than is the case with the very structured presentation of highly salient cues that occurs in present experimental research on alcohol-related aggression. Using the alcohol-induced information processing impairments documented in

several different types of experiments, one might explore whether drinkers opt for cognitively simple schemas in their orientation to a situation or a task (as suggested in the integrative illustration above). A more open-ended method for studying cognitive influences would allow us to ask such questions, as are cognitive schema selections based more on ease of application after drinking than in a sober state (i.e., does this selection indicate pigeonholing and decreased regard for how well the schemas fit the situational requirements?)? It also seems possible to directly test the basic assumptions of the model presented above that hypothesizes a tendency after drinking to select cues and schemas that are more immediate and salient and to neglect schemas that are not supported by eliciting cues in the immediate situation.

Semiotic aspects of interaction may also be affected by drinking-related cognitive changes and may partially determine the outcome of social episodes through verbal and nonverbal communication (Bostrom and White 1979). The persistent behavior of drinkers, sometimes interpreted as a sign of a "one-track mind," may be indicative of the fact that alcohol reduces cognitive capabilities to "one channel" or "single problem space" (Simon 1979) information processing. Similarly, the repetitiveness and loudness of intoxicated individuals may all be outcomes of cognitive deficiencies brought about by alcohol. Through interactional dynamics and interpersonal attributions they may increase the risk of conflict and aggression.

An important type of semiotic determination occurs within the transactional dimensions of human interaction (see Berne 1964). Conflict, aggression, and the outcomes of aggression in an interactional event may signify power aspirations, a negotiation about responsibilities, or a way of achieving status in a peer group. It is probably a rather demanding cognitive task to keep transactional communication within its semiotic boundaries, since it requires the mastery of more than one problem space. The extent to which the encoding and decoding of sequences of acts with transactional meaning are impaired (or otherwise transformed in predictable ways) after drinking seems worth studying. For instance, if drinking leads to a "one-channel mind" in terms of cognitive processing, it can perhaps be expected that transactional dimensions of aggression and violence get pushed out of attentional focus in favor of the instrumentalities necessary for successful aggression and physical violence. Some evidence from natural episodes of violence suggests that this is the case.

Descriptive accounts of motivations for aggressive behavior while drunk are typically very barren since participants often cannot remember "what the fight was about." Whether they have not fully conceptualized their reasons and motives in the violence episode itself (when long-term memory effects have not yet been at play) needs to be studied. There is also some empirical evidence that trivial matters or perceptual distortions are more often the cause of violence after drinking than when the adversaries are sober (Kühlhorn 1984).

In experiments studying alcohol-related cognitive structuring tendencies, one would ideally "cross" simplicity with factors linked to the content of the schemata provided to the experimental subjects. Both behaviors indicative of positive and negative affect (including aggression) appear to increase in real-life drinking episodes.¹⁰ Therefore, it seems worthwhile to provide subjects a choice between antagonistic (hostile, competitive) and affiliative schemas requiring varying degrees of information processing capacity.

¹⁰ Findings from both interviews and systematic observations in the public drinking places of the Canadian community referred to earlier showed a higher prevalence of behavior indicative of positive affect over that of negative affect and aggression. Community residents reported that someone in their drinking company had laughed with (71–78 percent of the most recent drinking occasions in a public drinking place and a private home), hugged or backslapped (in 8–10 percent), and kissed or fondled (7–10 percent) someone else much more often than they had shown signs of negative affect. The percentages for arguing or quarreling were 4–5 percent, for bragging and showing off were 4–7 percent, and for crying were 3 percent for the two locations. In direct observations of groups of patrons in taverns and bars it was also found that positively valenced behavior such as laughing (displayed at 78 percent of the observed randomly selected tables with more than one patron), shaking hands (22 percent), backslapping (16 percent), hugging (10 percent), kissing on cheek (8 percent), etc., was more common than behavior indicating negative affect, including bragging or showing off (displayed at 13 percent of the tables), arguing or quarreling (10 percent), pushing or shoving (4 percent), other physically aggressive behavior (3 percent), threatening gestures (4 percent), and crying (1 percent). The most often encountered aggressive behavior was in fact of a playful kind; playful aggressive behavior was displayed at 16 percent of the tables at least once during the course of the 3-hour session of observations (Pernanen 1991, p. 199–201).

Many fascinating questions of great relevance to the general study of the nature of human emotions (sober and intoxicated) could be approached in studying alcohol's influence on human affect. For instance, it has been demonstrated convincingly that a great deal of the discrimination between different "feelings" among humans is based on contextual criteria perceived by the actor. This is most clearly demonstrated with regard to the influence of situational cognitive factors (Leventhal 1982; Schachter 1964; Schachter and Singer 1962); in fact, cognition-based theories of emotion have become widely accepted among psychologists (Averill 1983; Berkowitz 1983; Leventhal 1980). It has been extremely difficult to find clear-cut physiological processes and perceptions of these emotions that distinguish even between very different and seemingly basic emotions like anger, joy, or fear. If definitions of emotional states are based on contextual criteria with regard to such fundamental feelings, what about the presumed "feelings" of powerlessness, alienation, or abandonment which are used freely as explanatory entities in sociology, psychiatry, and other disciplines dealing with human behavior? They clearly refer to whole, linguistically delimited scenarios encountered in human life; in order to understand these feelings we must (cognitively) know and recognize the necessary ingredients of these scenarios.

Philosophers, especially Wittgenstein (1958) and the numerous thinkers that he has influenced, have dealt with this question from a philosophical and linguistic point of view. Wittgenstein asks: "Can a dog feel expectation?" He is referring to the considerable cognitive content of the concept of "expectation." In light of alcohol's effects on cognition one might also ask: "Can an intoxicated person feel expectation?" Moreover, can he or she feel "powerless," "abandoned," "alienated," and many other of the explanatory feeling concepts encountered in the literature? If so, are alcohol's effects on cognitive processes the primary way in which alcohol can be used to "numb one's feelings," as well as "to forget"? Can an individual who has consumed large amounts of alcohol relatively easily be pushed into a state of "emotional confusion," as well as cognitive confusion? Or, is the drinker in a predominantly emotionless state if the cognitive criteria are missing? Or, if the cognitive criteria are perceived, attended to, and/or registered deficiently, is the drinker in a different emotional state from a sober person who would have available the same contextual criteria for emotion?¹¹

"Network" theories put forth for the explanation of human affect include several different kinds of criteria (stimuli or cues) for defining and recognizing specific emotions. These include motor responses and volitional expressions (Leventhal 1980, 1982). All these possible components of emotion are affected by alcohol!

¹¹ In this context it is perhaps relevant that there are studies suggesting that intoxicated subjects who behave aggressively do not feel as angry as sober subjects who react with aggression. One possible explanation among others is that they do not as easily perceive or cognize the contextual criteria for affective states.

in various ways. For instance, alcohol-related expectancies affect the definition of a situation and in this way also the drinker's affective set with regard to what occurs in the situation.

Finally, in addition to more basic studies of cue and schema selection and interpretation after drinking, there is a need for studies on attributions of intentions and motives in intoxicated interaction from a "real-life" social interactional perspective. We should also recognize that the different mediating processes that all the above suggestions point to are not mutually exclusive but may act together or in causal sequences.

CONCLUDING REMARKS

Studying alcohol-related aggression as an interdisciplinary project poses not only theoretical and empirical questions but preempirical concerns: These are conceptual, metatheoretical, and philosophical. Some conceptualizations are not specific to the study of alcohol-related behavior of any particular kind, but they may still be influential in determining our conceptualization of explanatory possibilities in the area.

It could be said that studying differences always occurs while standing on the common ground. This being the case, it is natural that differences get magnified as to their theoretical (and practical) import. This phenomenon has been pointed out with regard to studies of gender differences, where the great similarities between the male and female gender of *Homo sapiens* sometimes get hidden behind the differences that do exist. The same thing has inevitably occurred in conceptualiza-

tions linked to drunken comportment. Differences from sober behavior have been magnified in some prevalent conceptual frames, but the extent of this amplification varies from one field of study to another. Some explanatory paradigms posit alcohol-induced mechanistic processes in the explanations of drunken behavior (e.g., disinhibition processes and alcohol as a catalyst for violence). Expectancy theories of alcohol-related aggression do not acknowledge the causal role of alcohol-specific factors other than the cue value that alcohol has in acting on different sensory modalities. Social theories tend to stress the influence of social beliefs and normative strictures in explaining alcohol-related behavior to the exclusion of the pharmacological effects of alcohol. In this conceptualization there is no distinction in the determination of intoxicated and sober behavior.

From the perspective of "real-life" intoxicated behavior it is obvious that both the social and the psychological study of drunken comportment have been unnecessarily confined in their approach to the study of behavior under the influence of alcohol. The "inner logic" of present theoretical and empirical approaches has not been balanced by input from studies of natural episodes in the development of models of alcohol-related aggression. The scope of our explanatory attempts needs to be expanded.

A study of naturally evolving drinking occasions suggests that a broadened conceptualization ought to include two basic generalizations: (1) the explanation of alcohol-related aggression is part of the

explanation of intoxicated behavior generally, and (2) the explanation of intoxicated behavior is part of the explanation of human behavior generally. This implies that the explanation of alcohol-related aggression should explicitly seek central conceptualizations from the explanation of human *sober* behavior. Linked to this is the suggestion that drunken aggression should be seen as an outcome of the dynamic orientation of the drinker to a situation with typically shifting task demands. Basically the drinker tries to use the same cognitive schemas that he or she also uses in sober situations. However, there are selective cognitive processes at work after drinking that determine what the drinker can successfully use.

Instead of or in addition to the alcohol-specific explanations of drunken comportment such as "time-out," we need theories in which alcohol effects are allowed to blend in with "regular" orientational human activity. Alcohol-specific explanations, whether they refer to a mechanistic disinhibition process, cognitive expectancies related to the effects of alcohol, or to global social explanations such as time-out and mythical drinking, have the logical characteristics of trait explanations—alcohol as a chemical, social, or psychological entity is assumed to have these attributes that explain drunken behavior. By themselves, however, such explanations do not suffice because the conceptualizations that they engender are too static and do not take into account the several different causal roles that alcohol, drinking, and drunken-

ness have in forming observed relationships with violent behavior. They can be contrasted to process explanations. In a process-centered conceptual strategy, the processes that are active in drunken behavior can be largely the same as those under sober conditions. What has changed after drinking are the parameters entering into the process. For instance, the dynamics in orienting oneself to the environment after drinking are essentially the same as when sober, but the cognitive capabilities for achieving orientation and control have changed. At typical blood alcohol levels for serious violence these will probably have changed considerably toward the simple and the situational with ensuing effects on behavior.

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Considerations of Causes in Alcohol-Related Violence

Joan McCord¹

Studies of alcohol-related violence have lived on a legacy developed around the turn of the century. "Despite a certain inevitable variation from year to year," wrote Enrico Ferri in 1897, "there is a manifest correspondence of increase and decrease between the number of homicides, assaults, and malicious wounding, and the more or less abundant vintage" (p. 117). Ferri tracked wine consumption and criminal rates in France between 1829 and 1887. Ferri's observations, along with similar ones by Mary Carpenter ([1864] 1969), Cesare Lombroso ([1912] 1968), and Charles Goring (1913), assumed causal relationships accounted for correspondence between drinking rates and crimes. Reported rates of alcohol consumption by criminals were used to confirm that connection and to fuel the fight for Prohibition.

The co-occurrence of violence and drinking has been reported in numerous studies (e.g., Goodman et al. 1986; Shupe 1954; Virkkunen 1974; Wolfgang and Strohm 1956; Wolfgang 1958). Although many of the authors noted that because

they have no figures showing general drinking patterns, they cannot assess the association between drinking and homicide, the evidence nevertheless has been taken to indicate that drinking contributes to violence.

There is little reason to doubt that a sizable number of criminals are habitual drinkers. The proportion varies by type of crime, and among those who have committed serious crimes, the ones most likely to have been drinking at the time of the crime were the violent men (Amir 1971; Banay 1942, 1945; Bohman et al. 1982, 1983; Collins 1981; Flanagan and McGuire 1992; Gerson and Preston 1979; Murdoch et al. 1990; Nicol et al. 1973; Wikström 1985). Yet these facts provide little understanding of the role alcohol plays in relation to violence.

An adequate account should differentiate mere co-occurrence from causal relations between alcohol and violence. Drinking by violent men may be no more salient to their behavior than are their styles of walking and talking. Before attributing a causal relationship to alco-

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hol, we ought to consider criteria for making such a claim.

One form of behavior due to the influence of alcohol is behavior that would not have occurred if the actor were sober. Such behavior, presumably, would be judged wrong by the sober actor.

A related form of behavior due to the influence of alcohol is behavior that becomes permissible due to drinking, what Heath (1983) referred to as a kind of "time-out." Reports of wife beating in Latin American cultures have been linked with excessive drinking, especially among men classified as dependent rather than independent (Bunzel 1940; Maccoby 1972). Among the Camba of Bolivia, alcohol enabled cordiality for otherwise isolated and independent workers (Heath 1962, 1991). Such ritualized rule breaking is not, of course, limited to drinking occasions. For example, strong verbal attacks take place between future in-laws among the otherwise genial Nuer when they negotiate marriage (Evans-Pritchard 1951). Court jesters ridiculed royalty once they had donned cap and bells. Students in the United States ridicule their teachers during special assemblies dedicated to that purpose. In such circumstances, conduct that is ordinarily condemned is redefined. A variant form of redefinition may account for some results of laboratory studies on effects of alcohol.

Laboratory studies have shown that alcohol can increase the amount of pain one person gives another (Gantner and Taylor 1992; Gustafson 1992; Murdoch and Pihl 1985; Zeichner and Pihl 1979, 1980). Studies by Milgram (1974)

demonstrate that giving pain can be legitimized when it is authorized by suggestions from figures in authority. The degree to which laboratory studies of the effects of alcohol on aggression invoke such legitimizing redefinitions has not been assessed. Nor is it clear that the low levels of pain used in laboratory studies yield results that should be generalized to instances of violence in which injuries are more than passing events. Aggressive effects from alcohol appear to fade in group settings (Murdoch and Pihl 1985), so that definitions of situations appear to be contributing factors in the relation between alcohol and violence.

Sykes and Matza (1957) suggested that delinquents often prepare the way for their misdeeds by defining criminal actions as excusable, necessary, or permissible if rightly understood. Such "techniques of neutralization," "disengagement," or "deviance disavowal" have a counterpart in the role that alcohol sometimes plays in paving the way toward alcohol-related behavior. There are occasions when a person seems to drink in order to justify doing something that might seem impossible for a sober person. Rape and child abuse, Heath (1983) suggests, "may have been premeditated by sober individuals who became drunk as a sort of 'alibi' or preplanned extenuating circumstance" (p. 99). Alcohol can be considered a contributing cause for these occasions if, in the absence of alcohol, the deed would not be done.

Discerning the contribution of alcohol to violence requires having a general theory of action, though such a theory has

not received the attention Parsons and Shils (1951) argued it deserved. In part, this neglect can be traced to Hume's critique of causal concepts ([1739] 1888), and in part it is a residue from what might be called scientific relativism. Kuhn ([1962] 1970) expressed this relativism when he argued that scientific models can best be understood only in terms of general paradigms, paradigms that shift with fashion or taste rather than with evidence about the world. This view of science denigrated the role of causality and reality, concepts necessary for progress in understanding human action.

Empiricists had claimed that definitions rested on immediately perceivable objects which were, in fact, sense data. Sense data as well as ideas were private, individual, and privileged. The nemesis for empiricists turned out to be their inability to show how private experiences could be linked with public objects. Although seldom recognized in the social sciences, Tarski's ([1944] 1949) semantic definition of truth opened a passage between mental and perceivable events, paving the route to alternative perspectives on the nature of motivation. In contrast with empiricists' dogmas about the relationship between "the external world" and ideas, Tarski's theory provided a link through language (Davidson 1967; Quine 1981).

Intentional actions require motives. This implies that alcohol-related violent actions should include motives as contributing causes. An adequate analysis of the relationship between violence and the use of alcohol ought, then, to take into

account something like what Aristotle [1941] referred to as the material, formal, efficient, and final causes (*Physics* Bk. II, Ch. III). Although the terms are archaic, the distinctions they make are important to modern science.

Material causes are relatively stable conditions out of which a thing comes to be, and which persist. In relation to alcohol and violence, the notion of material cause should be interpreted in relation to groups of people who differ in risk. Alcohol-related violence is more likely for some people than for others. Cultures (Bales 1946; Maccoby 1972), legal structures (McCord 1992a; Williams and Lillis 1986), biological susceptibilities (Bohman 1978; Cadoret and Gath 1978; Goodwin 1976, 1981; Goodwin et al. 1974; Hill et al. 1987; Kaij and Dock 1975; McKenna and Pickens 1981; Schuckit 1984; Schuckit et al. 1972; Schuckit and Raynes 1979; Tarter et al. 1985; Templer et al. 1974), and social circumstances (Bennett et al. 1987; Blane and Barry 1973; Burk 1972; Cadoret et al. 1987; El-Guebaly and Offord 1977; Fox 1962; McCord 1988; Werner 1986; Zucker and Gomberg 1986) influence risk. The qualities of people, in particular places, under specified types of circumstances that heighten risk, provide the material causes for alcohol-related violence. If analyses of the conditions of risk mistake the role of material causes, the stable influences of these causes are likely to swamp data analyzed in relation to more transient factors.

For example, in his study of violence in Thunder Bay, Pernanen (1991) allowed gender to compete with presence of alco-

hol in the logistic regression models. As a result, Pernanen concluded that alcohol had little influence on aggression. "Gender of the attacker and the familiarity of the assailant to the victim, and even the location of the episode were more important in determining the type of act perpetrated by the assailant," he wrote (1991, p. 16). It is a mistake, however, to assume that a statistical relationship between sex and violence provides the foundation for understanding conditions under which alcohol and violence are sometimes connected.

Formal causes provide the archetype or form under which events occur. Formal causes serve as patterns for behavior. Sometimes they operate through expectations. Experimental studies demonstrate that expectations influence behavior, perhaps more strongly with alcohol than without. Some of these studies show that when males are led to believe they are drinking alcohol, whether or not the belief is true, they tend to become more aggressive (Lang et al. 1975; Steele and Southwick 1985). Cultural expectations, a type of formal cause, might also help to explain why women are less often involved as either perpetrators or victims of crimes outside the home.

Efficient causes are those that precede effects and necessitate or "compel" events for which they are the cause. These are what some have come to call "proximal causes" (Leonard, this volume; White et al. 1991). Whether one ought to count alcohol as an efficient cause of violence depends in part on the degree to which alcohol contributes to incidences of vio-

lence without regard to the motives of individuals. To assess this degree, one would like to consider a setting both with and without alcohol. The same, or similar, individuals would be tested under both conditions. If alcohol, either through its chemical or social properties, were to enhance the likelihood of violence, it would be reasonable to conclude that alcohol plays a role as an efficient cause of violence.

Final causes are those for the sake of which a thing is done. Goals or purposes of participants in violent incidences are relevant to understanding alcohol in relation to final causes. Motives have a window outward. Observers can infer motivations from patterns of behavior, so we need not rely solely on self-reports to study them.

To come to grips with alcohol-related violence, several types of intentional action can be considered, with differentiation based on both motives and contexts. These different types may involve quite different relations between alcohol and violence. A Venn diagram depicted in figure 1 helps to represent intentional actions as goal oriented, aggressive or violent, and alcoholic.

Aggressive behavior appears in four sets: "A," "B," "C," and "D." Expressive, nonalcoholic aggression represented in "A" is the type that occurs intentionally but seemingly without purpose. A case could be made that much of the recent destruction in south-central Los Angeles belongs to this set. The vandals knew what they were doing and chose to act destructively. Except for the looters, the

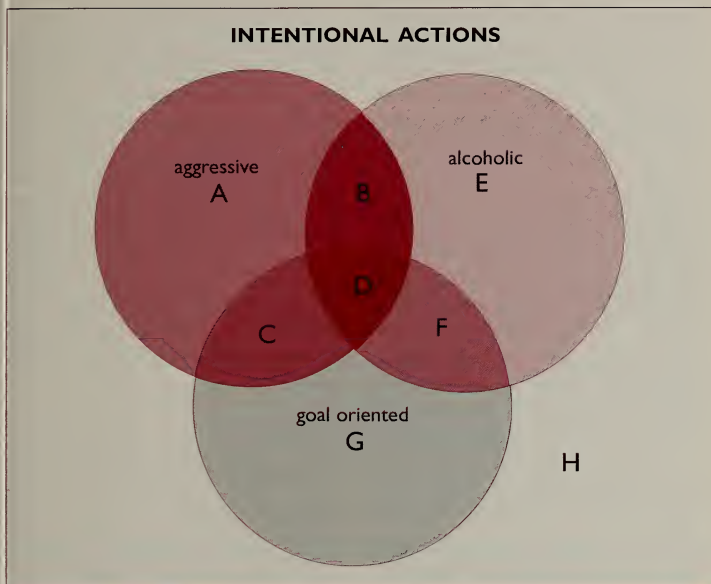


FIGURE I

Venn diagram for aggressive, alcoholic, and goal-oriented intentional actions.

evidence does not show that action was motivated by the desire to achieve any further goal than the destruction itself. The circumstances under which pointless violence occurs often suggest that expressive nonalcoholic aggression is caused by perceived injustice. Alcohol may facilitate such violent actions. When an actor has imbibed sufficient alcohol to qualify actions as alcoholic, expressive aggression should be classified in "B."

Aggressive goal-oriented behavior, represented in "C," is the type of behavior with which many of us are familiar.

Power, prestige, comfort, or even notoriety may motivate a person to injure others. When an actor has consumed sufficient alcohol to qualify actions as alcoholic, the aggressive goal-oriented behavior should be classified in "D," although the alcohol need not be a contributing cause for the aggressive action.

Of course not all alcoholic behavior is aggressive (see "E" and "F"). Affectionate behaviors as well as many other types of nonaggressive, intentional actions are performed under the influence of alcohol. Those that are goal oriented would be

classified in "F." "H" represents actions that are not goal oriented, not alcoholic, and not aggressive (or violent). Much of our daily behavior falls into this class. Expressions of exhaustion and interest—some of which are intentional—come into this class.

Cultures and groups can be expected to differ in terms of the distribution of intentional actions among the sets represented by this diagram. Violence in relation to alcohol could be detected through attention to the proportions of actions in "B" or "D" relative to those in "A" and "E." Unless such comparisons are made, little is learned by showing that many actions can be classified as alcohol-related violence.

Whether or not alcohol will be generative of violence depends partly on the nature of the motives people have for their actions. Egocentrism and aggression, in their different ways, tend to increase the probability of antisocial behavior (McCord 1992*b*). People who are antisocial are also likely to drink heavily (Leonard et al. 1985; McKenna and Pickens 1981; Robins 1966; Tarter et al. 1985). Whether alcohol actually increases the amount of their violence has not yet been demonstrated.

It seems plausible to hypothesize, however, that if alcohol reduces the ability to reason about the future, egocentric people may take into account only their short-term benefits, and aggressive people may increase their perceptions that situational cues justify injuring others. Such considerations would lead to increased violence when it seems as though violence would not result in short-term costs.

In sum, the Aristotelian view of causality reminds us that the characteristics of people most likely to be violent when drinking alcohol ought not be confounded with the circumstances under which these people (and sometimes others) drink and become violent. Nor can either explain alcohol-related violence without consideration of the purposes served by drinking and the properties of alcohol in relation to violence. Though all of these conditions may legitimately be considered causes, their confounding impedes understanding of alcohol-related violence.

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Part 2:
Disciplinary
Perspectives

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Alcohol, Aggression, and Violence: Biobehavioral Determinants

Klaus A. Miczek, Elise M. Weerts, and Joseph F. DeBold¹

INTRODUCTION

From the perspectives of public health as well as criminal justice, alcohol is of paramount importance because it is the drug that is by far more frequently associated with violent and aggressive behavior than all other drugs combined (Secretary of Health and Human Services 1990). Recently, the voluminous world literature on alcohol, drugs of abuse, aggression, and violence in humans and in laboratory research with animals has been summarized and evaluated for the Violence Panel of the National Academy of Science (Reiss and Roth 1993). Alcohol was identified as "the drug that is most consistently and seriously linked to many types of aggressive and violent behavior" (Miczek et al., in press). The epidemiological and criminal statistics link alcohol to violence in a pattern that is large in magnitude; consistent over the years; widespread in types of aggressive and violent acts; massive in cost to individual, family, and society; and serious in suffering and harm.

As the findings in table 1 (and other chapters in this volume) illustrate, alcohol is

associated with at least half of all murders, rapes, sexual violence such as incestuous offenses, family violence, and felonies. In most cases the perpetrator as well as the victim of a violent incident have been drinking, and the statistics rarely differentiate between these two sources of the alcohol-violence interaction. However, much alcohol consumption occurs in individuals who do not engage in violent behavior. The base rates of drinking associated with violent and non-violent incidences at a specific time of day, day of week, and place remain unknown.

While the epidemiological statistics point to violent behavior as a leading cause of death and harm, and while alcohol consumption is part of this behavior in more than half of all occurrences, the neurobiological mechanisms of alcohol's action that are responsible for its violence- and aggression-heightening effects are only beginning to be elucidated. Contrary to the spectacular successes in identifying a defect on a particular chromosome in various neurological disorders, the varied pharmacological conditions under which alcohol can

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increase the probability of aggressive and violent behavior involve multiple mechanisms. In a recent review, we concluded

whether or not alcohol, in a range of doses, ingested orally, causes a certain individual to act aggressively more frequently or even engage in "out of character" violent behavior depends on a host of interacting pharmacological, endocrinological, neurobiological, genetic, situational, environmental, social and cultural determinants (Miczek et al., in press).

The present discussion will provide (1) a rationale for considering experimen-

tal preparations in species other than humans as an important source for information on the pharmacological, behavioral, and neurochemical determinants of alcohol and aggressive behavior; (2) a critical evaluation of the findings that implicate brain serotonin, gamma-aminobutyric acid (GABA), and neurosteroids as particularly important neural systems for alcohol's effects on aggressive behavior; and (3) suggestions for potential pharmacotherapeutic interventions in the reduction of alcohol-heightened aggressive and violent behavior.

ANIMAL MODELS OF AGGRESSION

Anthropological, sociological, and epidemiological aspects of the alcohol-

TABLE I

Epidemiological Data on Alcohol and Violence

Type of violence	Individuals drinking alcohol (%)	References
Rape	50	Shupe 1954
	53	McCaldon 1967
	35	Rada 1975
	57	Rada et al. 1978
	72	Johnson et al. 1978
	65	Barnard et al. 1979
Incest	49	Virkkunen 1974b
	50	Browning and Boatman 1977
Family violence	40	Gayford 1979
	15-20	Eberle 1982
	83	Livingston 1986
Murder and homicide	36	Wilentz and Brady 1961
	10	Scott 1968
	57	Grunberg et al. 1978
	56-83	Bloom 1980
	56	Lindqvist 1986
Felonies	61	Tinklenberg and Ochberg 1981
	33	Guze et al. 1968
	57	Mayfield 1976

aggression link cannot be subjected very readily to experimental analysis under controlled laboratory conditions (see also Brain 1986). Research with animal preparations is the primary source for systematic empirical evidence on the actions of alcohol on aggression-specific neural mechanisms. Inquiries into the distal and proximal *causes* of aggressive behavior have to rely on experimental manipulations of the hypothesized causative variables, and these types of studies are only feasible in species other than humans. Inferences about the causative function of alcohol in increasing aggressive behavior in humans are mainly based on *correlative* evidence, where the occurrence of particular incidents of aggressive and violent behavior are correlated with a particular pattern of alcohol consumption some time in the past (table 1).

Separate major conceptual frameworks, originating in ethology, experimental psychology, neurology, and neuropsychiatry, have given rise to several experimental preparations in animals for the study of alcohol, aggression, and violence during the last decades. These scientific traditions begin with considerably different assumptions, employ specific methodologies, and emphasize either the adaptive nature of behavior in conflict or the antisocial, destructive nature of behavior determined by aversive environmental events or neuropathologies.

Ethological Approach

The ethological approach focuses on aggressive behavior that serves an adaptive function (e.g., Lorenz 1966; Huntingford

and Turner 1987). The proximal and distal causes for aggressive behavior are studied in various situations and species in the field or laboratory. The sociobiological analysis depicts aggressive behavior as having evolved as a tool in reproductive strategies (Wilson 1975). A dominant female may suppress the receptivity of a rival female and thereby decrease her rival's reproductive potential (Floody 1983). A dominant male may ensure the transmission of his genes into the next generation at a higher frequency by limiting lower ranking males' access to important resources. Quantitative ethological analysis assesses the behavioral repertoire in conflict situations, often called agonistic behavior (Scott 1966), which comprises not only pursuits, threats, and attacks, but also defensive and flight responses and submissive and appeasement displays. Even under experimental conditions in the laboratory, the ethological study of aggressive behavior retains a high degree of validity, with a focus on defending a territory, forming and maintaining a social group, or defending newborns by the maternal female (Miczek 1983).

While various human aggressive behavior patterns have been ethologically analyzed for their morphology, ontogeny, and functionality (Lorenz 1966; Eibl-Eibesfeldt 1989), it remains to be determined how excessive aggressive behavior or violence in humans relates to the adaptive types of aggressive interactions. The genetic and developmental characteristics of the neurobiological mechanisms for various aggressive behaviors in situations of conflict may be on a continuum with

those for human violence. Alternatively, adaptive and maladaptive patterns of aggressive behavior may involve entirely separate mechanisms (Sheard 1984). Detailed comparative analysis of aggressive behavior allows an assessment of whether a particular behavior pattern is typical for the animal species under investigation or is excessive in nature. If it is possible to engender intense and excessive aggressive behavior in alcohol-drinking animals, then these experimental preparations deserve close scrutiny as potential models for the human condition.

EXPERIMENTAL PSYCHOLOGICAL APPROACH

Experimental psychological approaches to the study of aggressive behavior have emphasized the aversive environmental conditions that precede this behavior, or the reinforcing consequences of this behavior (Kelly 1974; Cherek and Steinberg 1987). A most prominent experimental protocol based on these principles involves aggressive behavior in response to the omission of scheduled reinforcement, a phenomenon often hypothesized to result from frustrative nonreward (e.g., Dollard et al. 1939). Experimental protocols of extinction-induced or "frustration"-induced aggressive behavior are characterized by high intrinsic and face validity, and may be implemented in various animal species as well as humans. In fact, alcohol's effects on extinction-induced aggression have been investigated in humans and other animal species (e.g., Taylor and Gammon 1975; Cherek et al. 1984; Kelly et al. 1988;

see review by Pihl, this volume). Other experimental preparations rely on the exposure to painful, noxious stimuli such as electrical shock pulses to evoke aggression of a defensive nature (e.g., Sheard 1981; Blanchard and Blanchard 1984). The relationship between human violent behavior and pain-provoked aggressive and defensive behavior in animal species remains to be delineated. Yet another experimental manipulation of a more pervasive manner involves housing animals singly or, alternatively, under crowded conditions. After imposition of prolonged isolated or crowded housing, aggressive behavior toward nonaggressive partners can be induced in a certain proportion of otherwise placid animals (e.g., Valzelli 1973; Malick 1979). Whether aggressive, defensive, or social withdrawal reactions are induced by isolated or crowded housing conditions depends on the species-typical social organization that may range from territorial to colonial (e.g., Crowcroft 1966; Southwick 1969). For the experimental analysis of the link between alcohol and aggressive behavior, a particularly valid laboratory model appears to be the extinction-induced or frustration-induced aggression preparation, both in animals and in humans. A critical need for this experimental approach is to relate the extinction-induced aggressive responses under controlled laboratory conditions more directly to violent behavior outside of the laboratory.

Neuropsychiatric Approach

Aggressive behavior and violent outbursts are symptoms in a range of neurological

and psychiatric disorders. It is unfortunate and conceptually unsatisfactory that violent and aggressive behavior are not very well defined in the psychiatric clinic. Following the diagnostic terminology and criteria of the revised *Diagnostic and Statistical Manual of Mental Disorders* (American Psychiatric Association 1980), aggressive and violent behavior may be part of "Conduct Disorder" in adolescents, "Isolated or Intermittent Explosive Disorder" in adults, "Parent-Child Problem" in certain cases of child abuse, "Dementia," "Schizophrenia," "Alcohol and Substance Abuse," "Depression," "Mania," "Antisocial Personality Disorder," "Mental Retardation," and "Attention-Deficit Disorder" (e.g., Eichelman 1986).

Violent or pathological aggressive behavior can be a symptom of several neurological diseases. Patients with seizure disorders, limbic or hypothalamic tumors, Lesch-Nyhan syndrome, Down's syndrome, or Gilles de la Tourette's syndrome exhibit aggressive and violent outbursts (e.g., Siegel and Mirsky, in press).

Animal models of psychiatric and neurological disorders associated with violent and aggressive behavior have often relied on experimental brain lesions, neurotoxic insults, or electrical stimulation of discrete neural foci. Laboratory rats that have sustained damage to brain structures such as the septum, hippocampus, amygdala, or ventromedial hypothalamus may exhibit "rage"-like responses (e.g., Albert and Walsh 1984). Similarly, neurotoxic insults targeting brain catecholamines

may engender intense biting and hyperdefensive reactions (Eichelman and Thoa 1973). These methodologies have not been applied in alcohol research.

Aggressive and violent behaviors as symptoms of a central nervous system (CNS) disease, based on a more or less well delineated neuropathology, lead to an understanding of causality and mode of intervention that differs profoundly from that of aggressive behavior as an antisocial or adaptive behavior. It is important to diagnose adequately those instances in which alcohol leads to violent and aggressive behavior by aggravating an already underlying neuropathology. Such cases prompt the development of a different mode of prevention and intervention than would be the case for environmentally provoked aggressive behavior. In sum, the basic premise for considering animal models as a source for information on how alcohol is related to violent behavior is based on the evolution of neurobiological mechanisms mediating behavior.

Violent and aggressive behavior, like other behavior, is ultimately a function of integrated neural activity. Neural mechanisms have evolved for physiological and behavioral processes subserving the most basic survival functions as well as the most advanced and complex functions. Aggressive and violent behavior patterns as well as their underlying neural mechanisms are no exception to these evolutionary developments. While there is impressive evolutionary constancy in the development of neuroanatomical and neurochemical systems such as those for biogenic amines, neuropeptides, and

neurosteroids, there is also diversity in functional adaptations. Extrapolating from studies on alcohol and animal aggression to problems of human violence is instructive with the perspective that many types of aggressive behavior have evolved for a variety of purposes and that many neurochemical systems subserve diverse functions. The evolutionary roots for many types of human violent and aggressive behavior still remain to be fully understood. Behavioral evidence from animal studies lends itself to generalizations beyond the specific species and circumstances of an experimental animal preparation when based on comparative data in several species and various environmental conditions.

PHARMACOLOGICAL DETERMINANTS

The dose, timecourse, chronicity, and interactions with other drugs are among the most important pharmacological determinants of alcohol's effects on aggressive behavior (e.g., Miczek 1987).

Dose

In several experimental preparations ranging from fish, to birds, to mammals, including humans, acute low alcohol doses may increase aggressive behaviors, and higher doses decrease these types of behavior. While the consistent decrease in aggressive behaviors at higher alcohol doses is primarily due to their sedative and incapacitating actions, the less consistent increase at low doses is alternatively attributed to alcohol's putative disinhibitory actions or aggression-stimulatory actions in certain individuals (e.g., Brain 1986).

Not every administration of low alcohol doses results in increased aggressive behavior in every individual under all circumstances. As a matter of fact, many experimental studies with animals from various species did not detect increased aggressive responses after administration of low alcohol doses when analyzed with classic group statistics (see review by Berry and Smoothy 1986). Low alcohol doses (i.e., 1 g/kg or less) are rarely explored in experimental animal preparations or in clinical research settings with humans; yet, upon acute administration, it is this low alcohol dose condition that leads most often to increased competitive, aggressive, and violent behavior in fish, mice, rats, cats, dogs, nonhuman primates, and college students and other paid experimental subjects (e.g., Chamove and Harlow 1970; MacDonell et al. 1971; Ellman et al. 1972; Chance et al. 1973; Peeke et al. 1973, 1975; Taylor et al. 1976; Miczek and Barry 1977; Pettijohn 1979; Miczek and O'Donnell 1980; Bammer and Eichelman 1983; Yoshimura and Ogawa 1983; Pihl and Zacchia 1986; Blanchard et al. 1987; Kelly et al. 1988; Lister and Hilakivi 1988). It is noteworthy that a wide range of aggressive and competitive behaviors can be increased by low acute alcohol doses. As a matter of fact, many behavioral, endocrinological, and other physiological actions of this drug follow a biphasic pattern of alcohol dose-dependency in animals and humans, with low doses causing increases and high doses causing decreases (Pohorecky 1977).

In human experimental studies during the past two decades, it was repeatedly

found that acute low-dose alcoholic drinks lead to heightened aggressive behavior, usually in competitive tasks. For example, alcohol dose-effect determinations on human aggressive behavior in an experimental competition task show large aggression-heightening effects in a dose range from 0.5–1.25 ml/kg of 50 percent alcohol (Cherek et al. 1984, 1985; Kelly et al. 1988, 1989). It would be unethical to conduct comparable alcohol dose determinations for violence-heightening effects outside of the controlled laboratory situation. Yet, one may question the predictive validity of alcohol effects on laboratory measures of human competitive behavior for the incidence of violence.

As the dose of alcohol increases, different behavioral elements and signals during social confrontations are qualitatively affected. Several detailed ethological analyses of behavior in conflict in a range of mammalian species, including rodents and primates, demonstrate how threat and attack, defense and flight, and sedative effects are affected at incremental doses of alcohol treatment (Krsiak 1975, 1976; Miczek and Barry 1977; Miczek and O'Donnell 1980; Yoshimura and Ogawa 1983; Miczek 1985; Winslow and Miczek 1985, 1988; Blanchard et al. 1987; Miczek et al. 1992). Very low alcohol doses (0.1–0.6 g/kg) increase threat and attack under appropriate conditions and begin to distort communicative signals. A twofold to threefold increment in alcohol dose (1.2–1.6 g/kg) provokes more injurious attacks in alcohol-treated individuals that are associated with a disruption of

appropriate signals of submission and appeasement. A further twofold increase in alcohol dose has sedative effects. Socially nonprovoked and unchallenged individuals show sedative effects at considerable lower alcohol doses than those under social demand, which presumably is linked to different degrees of catecholamine activity.

Phases of Alcohol Action

During the initial phase of alcohol action, when blood alcohol content (BAC) is increasing, the motorically activating, euphorogenic effects are most prominent (Babor et al. 1983). This is the first phase for alcohol's aggression-enhancing effects to become apparent; most experimental studies of aggressive behavior in animals or humans have focused on this early phase of alcohol action. It is unknown how the rate of increase in BAC is related to the likelihood of being more prone to aggressive and violent behavior. The subsequent phases of increasing or maintained alcohol intoxication as well as the phase of decline in BAC are associated with dysphoric and depressive effects of the drug. Again, no experimental evidence identifies the specific phases of intoxication and of withdrawal-like recovery with any precision in their relation to behaving violently or aggressively. In apprehended individuals who have committed a violent crime, BAC's are usually obtained within 24 hours after arrest, that is, at a variable time after the actual commission of the aggressive and violent acts (e.g., Dembo et al. 1991). It should be possible to reconstruct the actual degree

of alcohol intoxication if the time of BAC determination, the time of arrest, and the times of the violent acts and the triggering events were recorded accurately.

Chronicity

Most clinical and epidemiological studies of heightened aggressive and violent behavior focus on individuals with a chronic alcohol problem (Miczek et al., in press). By contrast, the experimental studies of alcohol, aggression, and violence in animals and humans have most commonly focused on acute alcohol. In a few studies in mice, rats, and monkeys, chronic alcohol was administered at intoxicating levels, and unusual, intense forms of aggressive behavior emerged under stress conditions (e.g., Tramill et al. 1980, 1983; Pucilowski et al. 1987). Of

particular interest is a recent demonstration of severe, injurious attack bites by rats administered three daily alcohol doses toward intruders into their living space (see table 2; Peterson and Pohorecky 1989). The typically ritualized aggressive behavior in such resident-intruder confrontations in rats shifted to more intense and injurious forms of attacks over the course of chronic alcohol administration. Experimental situations of chronic alcohol treatment appear to be particularly informative and relevant models of the human condition. In primates, a few studies suggest that chronic alcohol intake leads to increased play fighting in juveniles, self-biting in isolation-reared rhesus monkeys, and aggressive displays in pigtail macaques (Chamove and Harlow 1970; Cressman and Cadell 1971; Kamback

TABLE 2

Wounding as a Result of Alcohol Intoxication

Wound location	DM resident	ET resident
Mean wound distribution on intruder rats by resident drug type		
Upper back	1.59 ± 0.66	2.12 ± 0.83
Lower back	0.47 ± 0.23	2.53 ± 0.65
Ventral surface	0.12 ± 0.08	1.35 ± 0.44
Mean wound type on intruder rats by resident drug type		
Small (0–5 mm)	1.41 ± 0.47	4.53 ± 1.22
Medium (5–10 mm)	0.18 ± 0.13	1.12 ± 0.32
Large (>10 mm)	0.12 ± 0.08	0.29 ± 0.14

Data represented from Peterson and Pohorecky 1989.

Resident mole rats received ethanol (ET) 20 percent weight by volume in water or the isocaloric equivalent dextrin-maltose (DM) 32 percent weight by volume in water three times per day.

1973). At present, experimental data from chronic alcohol studies under controlled laboratory conditions remain preliminary, particularly in self-administration studies.

Mode of Administration

In an effort to control the pharmacological conditions of alcohol, laboratory research on the biological and environmental determinants of the link between alcohol and aggression in animals involves administration of the drug by the experimenter. Epidemiological statistics of violent and aggressive behavior are routinely based on alcohol-intoxicated individuals who have self-administered this drug; this route of administration needs to be implemented in laboratory studies in order to enhance their validity. During the last decade, experimental preparations in rodents and primates have been developed that achieve voluntary intake of alcohol at intoxicating doses (e.g., Crowley and Andrews 1987; Samson et al. 1989). The application of these methodologies would enable a detailed analysis of the conditions under which self-administered alcohol leads to increased aggressive behavior and, vice versa, how situations of social confrontation influence alcohol self-administration. There are indications that consumption of high-concentration drinks of alcohol, such as distilled alcoholic beverages, is more likely to enhance aggressive behavior than is beer in laboratory competitive tasks in humans (Pihl et al. 1984a,b).

Behavioral Determinants

Individuals differ greatly in whether or not alcohol consumption will increase

their aggressive and violent behavior. A key task for future research is the behavioral and biochemical characterization of those individuals who are most prone to engage in highly aggressive and violent behavior in different phases of alcohol intoxication. This objective may require an approach at variance with the traditional standards of experimental research, which include the use of group statistics. Many seemingly contradictory results from studies of alcohol and aggression in animals as well as in humans may be resolved by differentiating individuals according to their behavioral and biochemical characteristics with regard to alcohol and aggression. In nearly all animal species there are individuals that engage in aggressive behavior at a very high rate and intensity when under the influence of alcohol, whereas the same dose reduces aggressive behavior in other individuals (figure 1; Miczek et al. 1992). Clearly, statistical averages and pooling are inadequate means to describe this highly differentiated pattern. Genetic as well as experiential influences throughout the lifespan on the neurobiological mechanisms mediating alcohol effects and aggressive behavior patterns need to be delineated in order to predict, prevent, and intervene in a rational manner.

Social Set and Setting

Evidence from human as well as animal studies points to past and prevailing social conditions as highly significant factors in determining whether or not alcohol will increase aggressive and violent behavior. Even before alcohol is actually

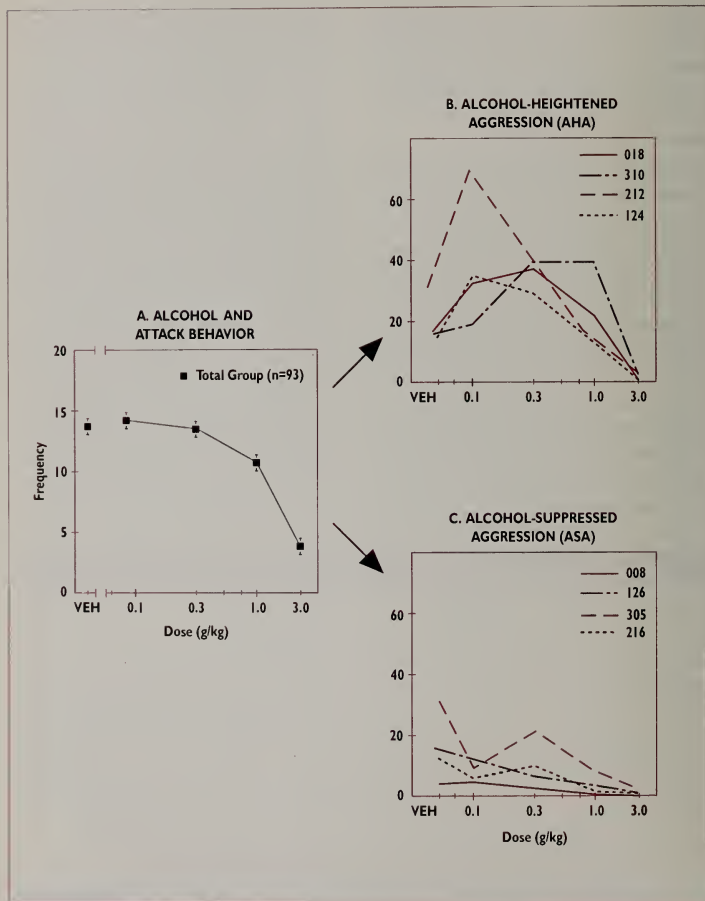


FIGURE 1

Effects of alcohol on frequency of attack behavior. A. Alcohol dose-effect curve for the total population ($n = 93$). B. Four selected individual alcohol dose-effect curves showing increases in attack frequency at several alcohol doses. C. Four selected individual alcohol dose-effect curves showing suppression of attack behavior at all alcohol doses. Reprinted from Miczek et al. 1992.

consumed and exerts its intoxicating effects, and independent of the type of beverage, the social context and the personal characteristics of the participants have been found to contribute to bar-room aggressive interactions (e.g., Boyatzis 1975; Graham et al. 1980). In an experimental laboratory preparation, alcohol has been shown repeatedly to more than double the rate of aggressive acts and displays in those individuals that occupied "alpha" status in a group of squirrel monkeys, but not in low-ranking group members (figure 2; Winslow and Miczek 1985, 1988; Weerts et al. 1993b). Status or rank within an established social network, based on a history of dyadic interactions with other group members, appears to be a relevant determinant of alcohol's effects on aggressive behavior in rodent and primate species.

A complex and long history in specific settings where alcohol is available and is frequently consumed, and where certain alcohol-induced behavioral changes are approved and sanctioned, leads to repeated demonstrations of the so-called "expectancy" effect. The mechanism for heightened aggressive and violent behavior by an individual who has expected to imbibe an alcoholic beverage, but has in fact consumed a pharmacologically inactive substance, is not understood. Beliefs and expectations about alcohol have significant effects on the probability of subsequent aggressive behavior, as demonstrated in laboratory experiments where subjects expect drunken individuals to behave more aggressively (e.g., Gustafson 1986a,b). While there are some

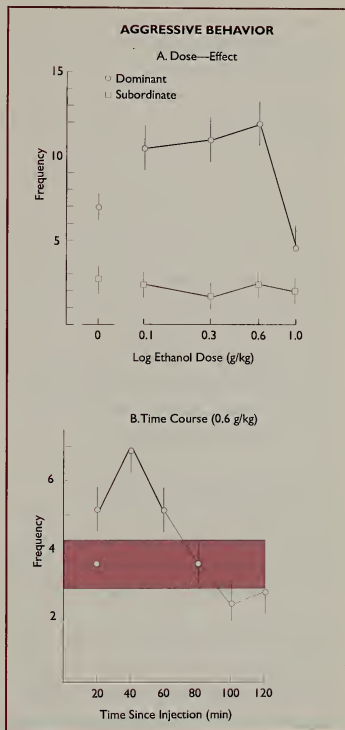


FIGURE 2

A. The frequency of aggressive behavior (grasps, displays, displacements) during the 40-minute period starting 5 minutes after alcohol administration to dominant ($n = 5$) and subordinate ($n = 6$) members of groups of captive, freeranging squirrel monkeys. Vertical lines in each data point indicate \pm SEM. B. The frequency of aggressive behaviors measured in consecutive 20-minute segments of a 2-hour observation. The data represent the effects of 0.6 g/kg alcohol on the aggressive behavior of dominant male squirrel monkeys ($n = 5$). The shaded area represents the mean \pm 1 SEM of five water vehicle control tests for each of the five dominant monkeys. Reprinted from Winslow and Miczek 1985.

demonstrations of the expectancy effects independent of the actual BAC in experimental measures of human aggressive behavior in competitive laboratory protocols (e.g., Lang et al. 1975; Rohsenow and Bachorowski 1984), the pharmacological effects of alcohol emerged as the stronger determinant on these measures of aggression than any expectancy effects in other situations (e.g., George and Marlatt 1986; Pihl and Zacchia 1986). The neurobiological basis for the effects of expectancy on alcohol's ability to heighten aggression remains elusive. It may be of interest to characterize the expected alcohol effects on aggressive behavior by attenuating them with pharmacological antagonists.

History of Aggressive Behavior

Ample evidence from human and animal studies demonstrates how the behavioral history of aggressive and violent behavior is of paramount importance in determining the nature of alcohol's effects on these behaviors (e.g., Miczek and Barry 1977; Rydelius 1988). For example, based on interviews of boys and girls in Finland, aggressiveness in boys at age 8 significantly predicted heavy drinking at age 20, and it also predicted more violent offenses and criminality (Pulkkinen 1983). In animal studies, the rate of attack and threat behavior more than doubled only in those alcohol-treated rodents or monkeys that had a history of aggressive behavior in dyadic confrontations; animals with a history of submissive or defensive behavior did not become aggressive when given alcohol (DeBold and Miczek 1985; Winslow and Miczek 1985; Blanchard et al. 1987*b*). It

would be useful to specify the neurobiological and behavioral characteristics of those individuals for whom early life events, in the family and with peers and rivals, triggered the potential for alcohol to engender heightened aggressive behavior.

Target of Aggressive Behavior

When comparing the human epidemiological data with the experimental studies in animals, it is apparent that humans often direct their increased aggressive behavior and violent acts during alcohol intoxication toward acquaintances and family members (see Miczek 1987). By contrast, most evidence from laboratory studies in animals, particularly in rodents, is based on heightened and injurious aggressive behavior toward unfamiliar opponents. The demonstrations of increased aggressive behavior within social groups of nonhuman primates after alcohol administration appear particularly relevant to the human condition. Detailed ethological analyses are required in order to delineate the distortions in the communicative processes between the alcohol-intoxicated individual and the potential target of aggressive behavior. Sending and receiving of signals that convey provocative or appeasing messages during social confrontations may be important targets for alcohol's action that ultimately lead to increased aggressive and violent behavior. At present, only indirect evidence for this distorting effect of alcohol on communicative signals exists.

In animal as well as human studies, it has been demonstrated that increased aggressive and violent behavior is directed

toward individuals who are intoxicated with alcohol. If only one member of a dyadic confrontation is treated with alcohol, either acutely or chronically, then the alcohol-treated mouse, rat, or monkey will provoke more aggression from the nontreated opponent (e.g., table 2; Miczek et al. 1984; Blanchard et al. 1987c; Peterson and Pohorecky 1989). These experimental data from animal preparations may provide insight into the correlation between high risk for injury during violent encounters and alcoholism (Wolfgang and Strohm 1956; Virkkunen 1974a,b; Abel et al. 1985). Detailed analysis of escalating interactions is required to assess the contribution of the alcoholic to the ultimately violent outcome of these confrontations.

NEUROBIOLOGICAL MECHANISMS

Evidence during the last decade points to subtypes of serotonin (5-hydroxytryptamine or 5-HT), N-methyl D-aspartate (NMDA), and GABA receptors as sites of action for alcohol that are particularly relevant to several of this drug's behavioral effects and its abuse liability (e.g., Tabakoff and Hoffman 1987; Deitrich et al. 1989). How critical any of these neurochemical systems are to the mediation of specifically heightened aggression associated with various stages of alcohol intoxication has not been definitively established.

Serotonin (5-HT)

The role of 5-HT in aggressive and violent behavior has been repeatedly discussed in the context of mechanisms mediating poor impulse control, alcoholism, obses-

sive-compulsive disorders, suicide attempts, irritability, and hostility (Asberg et al. 1987; Roy and Linnoila 1988, 1989). However, the evidence in both animal and human studies does not support a direct and simple link between brain 5-HT deficiency and aggression.

Brain Levels of 5-HT and 5-HIAA

Studies that measured 5-HT or its metabolite 5-hydroxyindoleacetic acid (5-HIAA) in whole brain in mice report an increase, decrease, or no change associated with aggressive behavior (Garattini et al. 1967; Modigh 1973, 1974; Goldberg et al. 1973; Lasley and Thurmond 1985). Mice engaged in offensive aggression show large increases in 5-HT turnover in selected brain regions, particularly the amygdala (Garris et al. 1984; Broderick et al. 1985; Haney et al. 1990), whereas rats reacting with defensive aggression show decreases in 5-HT or 5-HIAA in mesencephalic and striatal regions (Lee et al. 1987). It appears that 5-HT may play functionally opposite roles in specific brain regions to modulate offensive and defensive types of aggressive responses.

5-HT and "Killing"

The most compelling evidence of a link between low 5-HT functional state and aggression comes from studies of rats engaged in "predatory aggression" or mouse killing (see for review Miczek and Donat 1989). Animals that did not display killing behavior under baseline conditions are more likely to do so when serotonergic neurotransmission is inhibited as a result of synthesis inhibitors,

lesions, or a lack of the serotonergic precursor *l*-tryptophan in the diet (Di Chiara et al. 1971; Eichelman and Thoa 1973; Vergnes et al. 1973, 1988; Banerjee 1974; Breese and Cooper 1975; Gibbons et al. 1978; Isel and Mandel 1989). In contrast, facilitation of serotonergic neurotransmission by blocking 5-HT reuptake or metabolism, administering precursors, or providing excess tryptophan in the diet effectively reduces killing behavior (Kulkarni 1970; Bocknik and Kulkarni 1974; Gibbons et al. 1978, 1981). However, some rats kill mice and show either no change or an increase in 5-HT/5-HIAA, while others fail to show mouse killing behavior despite 5-HT depletions (Miczek et al. 1975; Broderick et al. 1985).

Modulation by 5-HT of killing behavior depends on the subject's experience and species-typical predatory behavior. Rats that are habituated to their potential prey will not develop killing behavior following 5-HT manipulations (Marks et al. 1977; Vergnes et al. 1977; Vergnes and Kempf 1981). Similarly, killing behavior persists without altering levels, synthesis, or metabolism of 5-HT once it has been established (Vergnes and Kempf 1981). The predatory killing of some carnivores such as cats, ferrets, or grasshopper mice does not appear to be modulated by serotonergic mechanisms (McCarty et al. 1976; Leaf et al. 1978; Schmidt and Meierl 1980; Schmidt 1980). It is highly problematic to relate the 5-HT activity of mouse-killing laboratory rats to the issue of human violence during alcohol intoxication.

Cerebrospinal Fluid 5-HIAA and Aggressive Trait

Studies in nonhuman primates have yielded inconsistent correlations between aggression and measurements of 5-HT turnover in blood or cerebrospinal fluid (CSF) (Kraemer et al. 1985; Yodyingaud et al. 1985; Green et al., unpublished data). Aggressive dominant male vervet monkeys show elevated levels of 5-HIAA in CSF or 5-HT in blood and blood platelets (Raleigh et al. 1981, 1983*a,b*). Levels of 5-HIAA were unaltered in high- and low-ranking squirrel monkeys, while 3-methoxy-4-hydroxyphenylglycol (MHPG) was found to be increased in subordinates particularly during active conflict (Green et al., unpublished data). However, CSF 5-HIAA levels have been reported not to correlate with day-to-day aggressive acts in talapoin monkeys (Yodyingaud et al. 1985). Recently, Higley et al. (1991*a,b*) provided correlative data that point to a statistical association between age, aggressive behavior, and stress-induced alcohol drinking. However, the causal role of 5-HT subsystems and their receptors in an individual's alcohol drinking and subsequent heightened aggressive behavior awaits delineation.

The most thorough investigations on the relationship between brain serotonin and high incidences of violent and aggressive behavior in alcoholics stem from Finnish samples of recidivists and fire-setters (e.g., Virkkunen et al. 1989*a,b*). Alcohol-abusing male criminals who were classified as "impulsive" or "nonimpulsive" were tested for blood glucose levels during a glucose tolerance test and levels of the

5HT metabolites 5-HIAA and MHPG in CSF. The level of blood glucose was a more effective predictor of nonrecidivism (43 of 44 cases) than recidivism (3 of 13 cases). When CSF 5-HIAA measurements were added to the predictive analysis, two more cases were correctly classified. Although CSF 5-HIAA measurements alone were not predictive of recidivism, levels of CSF 5-HIAA plus MHPG concentrations were successful predictors (i.e., 70 percent) of prior suicide attempts. However, additional studies that compared CSF 5-HIAA and MHPG levels of alcoholic patients with or without prior histories of suicide attempts to normal controls reported no significant difference among the three groups (Roy et al. 1990).

Low levels of CSF 5-HIAA have been inversely correlated with violent suicide (Asberg et al. 1976), history of violence (Brown et al. 1979, 1982; Linnoila et al. 1983; Lidberg et al. 1985), hostility and anxiety (Rydin et al. 1982; van Praag 1982; Roy et al. 1988), and criminality (Linnoila et al. 1983; van Praag 1982; Lidberg et al. 1985; Virkkunen et al. 1989*a,b*). Similarly, low levels of monoamine oxidase (MAO) in blood platelets have been proposed as a biological marker for traits such as increased sensation seeking, impulsiveness, childhood hyperactivity, alcoholism, and poor control of aggression based on correlations with CSF 5-HIAA (Ellis 1991; Belfrage et al. 1992). However, while some reports find a positive correlation between CSF 5-HIAA and MAO levels, others show little or no correlation (Asberg et al. 1987). In addition, how

measurements of CSF 5-HIAA or MAO levels in blood platelets relate to levels in discrete brain regions remains to be resolved (Asberg 1987; Eriksson and Humble 1990).

5-HT Receptors and Aggressive Behavior

The nonselective 5-HT receptor agonists and antagonists generally suppress aggressive behavior in animals of various species and under many conditions (e.g., Malick and Barnett 1976; Weinstock and Weiss 1980; Sheard 1981; Miczek and DeBold 1983; Nikulina and Popova 1983, 1986; Svare and Mann 1983; Winslow and Miczek 1983; Ieni and Thurmond 1985; Lundgren and Kantak 1987). The discovery of newer compounds that are more selective for specific receptor subtypes is expected to delineate more accurately the role of 5-HT systems in different patterns of aggression and defense. Drugs acting as 5-HT_{1A} agonists, such as 8-OH-DPAT ((±)-8-Hydroxydipropylaminotetralin), buspirone, and ipsapirone, and the 5-HT₂ antagonist ketanserin reduce offensive aggression in male and female rats (Haney and Miczek 1989; Olivier et al. 1990), but in a less selective manner than the mixed 5-HT_{1A/B} and 5-HT_{1B} compounds eltopazine and TFMPP (m-trifluoromethylphenylpiperazine) (Kruk et al. 1987; Olivier et al. 1987, 1991; Miczek et al. 1989). Initial reports in rats and mice indicate that 5-HT₃ antagonists exert non-specific effects on aggressive behavior (Mos et al. 1990). The effects of 5-HT_{1C} and 5-HT_D receptor agonists on aggressive behavior remain to be investigated.

At present, the evidence on brain 5-HT deficiency and alcohol-heightened aggressive behavior is correlative and indirect. The animal data linking aggression to low 5-HT functional activity are strongest for the mouse-killing phenomenon in laboratory rats; however, this type of behavior does not appear to be directly relevant to the alcohol-aggression association. Direct experimental tests of the proposed relationship between alcohol, 5-HT, and aggression require manipulations of alcohol intake, the functional state of 5-HT neural systems and their receptors, and various aggressive behavior patterns.

GABA_A-Benzodiazepine Receptor Complex

Alcohol exerts some of its effects via action on the GABA_A-benzodiazepine receptor complex. Alcohol has been reported to stimulate GABA_A receptor-mediated chloride conductance in mouse brain and spinal cord in a dose-dependent and biphasic manner without stimulating the release of GABA (Suzdak et al. 1986a,b; Harris et al. 1988; Mehta and Ticku 1988). These same studies also found that alcohol potentiates muscimol- or barbiturate-stimulated chloride uptake. The alcohol-induced enhancement of chloride flux is fully blocked by GABA antagonists and by benzodiazepine receptor full inverse agonists and partial inverse agonists (Suzdak et al. 1986a,b; Harris et al. 1988; Mehta and Ticku 1988).

Benzodiazepines such as the widely prescribed anxiolytic diazepam (Valium®) exert their behavioral and physiological actions via a large receptor complex in

nerve membranes that contains at least (1) the GABA_A receptor, (2) the benzodiazepine receptor, (3) the barbiturate/picrotoxin binding site, and (4) the chloride ionophore (Guidotti 1978; Lister and Nutt 1988; Haefely et al. 1990). Binding sites associated with the receptor complex are interrelated and modulate the other sites within the complex. Specifically, agonists binding at the benzodiazepine receptor facilitate the neurotransmission of the inhibitory neurotransmitter GABA by increasing the coupling of the neurotransmitter to the GABA_A receptor. Activation of GABA_A receptors, in turn, alters the biological activity of the cell membrane by opening the ion channel to allow passage of chloride ions. The increased chloride conductance through the cell membrane then produces a hyperpolarization of inhibitory neurons.

A number of distinct ligands bind to the benzodiazepine receptor and produce a range of behavioral and physiological effects (Little et al. 1987; Haefely 1988). In addition to the full agonists that are clinically used for their anxiolytic, anti-convulsant, or sedative/hypnotic actions, there are benzodiazepine receptor ligands that can produce functionally opposite effects such as anxiety and convulsions (i.e., inverse agonists) and ligands that are less potent with more selective actions (i.e., partial agonists and partial inverse agonists). In addition, there are ligands that exert few effects on their own, but block the effects of both agonists and inverse agonists (i.e., antagonists).

The physiological and behavioral effects of alcohol closely resemble those of

benzodiazepine agonists and barbiturates. Among the most prominent actions of these drugs are the anxiolytic, sedative, hypnotic, and anticonvulsant actions. In order to achieve these effects, these drugs need to act on the GABA_A-benzodiazepine receptor complex. Alcohol, benzodiazepines, and barbiturates also produce comparable biphasic actions on aggressive behavior (Miczek and Krsiak 1979; Olivier et al. 1991). Although benzodiazepines were originally used for their aggression-reducing or "taming" effects in animals, low, non-sedative doses of clinically used benzodiazepines increase aggressive behaviors in rats and mice (Miczek 1974; Krsiak 1976; Miczek and O'Donnell 1980; Mos and Olivier 1986, 1988; Mos et al. 1987a). Similarly, specific doses of benzodiazepines have been reported to increase irritability and hostility or produce "paradoxical rage" reactions in varying proportions of patients (Dimascio 1973; Gunn 1979; Lion 1981). Both the proaggressive and aggression-reducing effects of benzodiazepine agonists in rats are blocked by compounds that act as antagonists at this same site (Miczek 1985). When administered together at low doses, benzodiazepines further enhance the proaggressive effects of alcohol in mice (Miczek and O'Donnell 1980).

Aggressive and defensive interactions may be mediated at the GABA_A-benzodiazepine receptor complex (Beck and Cooper 1986a; Mos et al. 1987a; Olivier et al. 1991). Benzodiazepine receptor inverse agonists (e.g., FG 7142, Ro 15-4513, and β -CCE) reduce aggression directed at conspecifics in male and

female rats (Beck and Cooper 1986b; Mos et al. 1987b; Weerts et al. 1993b), and increase defensive behaviors in mice (Krsiak 1976; Sulcova and Krsiak 1987). In male rats, the benzodiazepine receptor antagonist flumazenil effectively prevents reductions in offensive aggression induced by inverse agonists (Beck and Cooper 1986b). Yet when administered alone, specific doses of benzodiazepine receptor antagonists ZK 93426 and flumazenil reduced aggressive and social interactions in rats and squirrel monkeys without producing sedation (Weerts et al., 1993a,b). (Figure 3)

Similar alcohol-benzodiazepine interactions are apparent from behavioral observations and preclinical "anxiolytic" tests based on specific behavioral responses produced by clinically effective benzodiazepine anxiolytics. Alcohol's ataxic, sedative, muscle relaxant, and hypnotic effects can be attenuated by pretreatment with the benzodiazepine receptor partial inverse agonist Ro 15-4513 (Bonetti et al. 1985; Suzdak et al. 1986a; Syapin et al. 1990; Deacon et al. 1991). Inverse agonists reduce the enhancing effects of alcohol on behavior that is suppressed by electric shock (Suzdak et al. 1986a; Koob et al. 1989; Glowa et al. 1989) or bright light (Belzung et al. 1988a,b; Misslin et al. 1988). Inverse agonists also prevented alcohol-induced reductions in exploratory motor behaviors (Lister 1987) and social interactions between two familiar rats in a novel, brightly lit arena (Hilakivi and Lister 1988).

The aggression-heightening effects of alcohol can be modified by pharmacological manipulations at the GABA_A-benzodi-

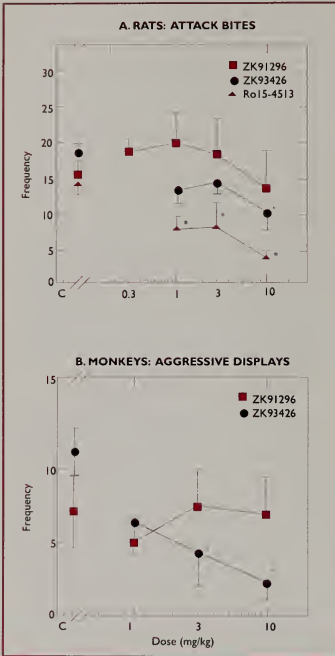


FIGURE 3

A. Effects of ZK 93426 ($n = 12$), ZK 91296 ($n = 10$), and Ro 15-4513 ($n = 12$) on attack bites in resident male rats directed toward an untreated intruder. B. Effects of ZK 93426 ($n = 9$) and ZK 91296 ($n = 7$) on aggressive grasps, threats, and displays in squirrel monkeys directed toward untreated group members. * $p < 0.05$ compared to vehicle control. Reprinted from Weerts et al. 1993a.

azepine receptor complex (Weerts et al. 1993b). Resident male rats and socially housed squirrel monkeys that showed reliable alcohol-induced (0.1–0.3 g/kg) enhancements of aggressive behavior were pretreated with benzodiazepine receptor

antagonists, ZK 93426 (3 mg/kg) and flumazenil (10 mg/kg), before aggression-enhancing and aggression-reducing doses of alcohol (figure 4). Both antagonists reduced the proaggressive effects of alcohol during confrontations with conspecifics, but did not alter the aggression-reducing and sedative effects. In fact, flumazenil pretreatment potentiated the sedative and motor incoordination effects of alcohol. When administered flumazenil prior to low doses of alcohol (0.1–0.3 g/kg), monkeys reduced locomotor activity and increased time spent in quiet sitting behavior to levels observed at the highest dose (1.5 g/kg) of alcohol alone. In addition, alcohol-induced motor incoordination was increased by flumazenil pretreatment. ZK 93426, on the other hand, antagonized alcohol-induced motor incoordination without overt sedative effects. These data suggest that the GABA_A-benzodiazepine receptor plays an important role in modulation of alcohol's proaggressive effects, separate from the other behavioral effects.

Classical theories of aggression inhibition by GABAergic systems have been proposed based on GABA's similar inhibitory actions on the mammalian CNS (Mandel et al. 1979, 1981). The interpretation of GABAergic influence on aggression ranges from inhibition to facilitation depending on the procedure of brain measurement and the type of aggressive behavior investigated (Mack et al. 1975; Earley and Leonard 1977; DaVanzo and Sydow 1979; Mandel et al. 1979; Haug et al. 1980, 1984; Potegal et al. 1982; Simler et al. 1982). However, increases and decreases in

GABA levels in the brain may not reflect functional changes at the receptor level.

Our laboratory recently examined the mechanisms for individual differences in response to the aggression-enhancing and aggression-reducing effects of benzodiazepine treatment in mice that were selectively bred to be highly aggressive or nonaggressive (Weerts et al. 1992). Selective breeding for high or low levels of aggressive behavior profoundly alters benzodiazepine receptor binding, GABA-dependent chloride uptake into cortical neurons, and behavioral response to benzodiazepine treatment. Nonaggressive mice had higher concentrations of benzodiazepine receptors in cortex, hippocampus, and hypothalamus, whereas the highly aggressive mice had a reduced concentration of receptors in these areas. Similarly, GABA_A-dependent chloride uptake was increased in the nonaggressive mice and reduced in the highly aggressive mice (figure 5). The nonaggressive mice were also more sensitive to chlordiazepoxide (17–30 mg/kg) as evidenced by marked reductions in motor activity. In contrast, the highly aggressive mice were resistant to the sedative effects of chlordiazepoxide (17–30 mg/kg), and chlordiazepoxide caused a behavioral shift from aggression to increased social interactions. Highly aggressive mice treated with high doses of chlordiazepoxide (17–30 mg/kg) displayed similar behavioral profiles as the untreated nonaggressive mice. These effects may be associated with interactions with an endogenous ligand at the benzodiazepine receptor. These data indicate a functional relationship between the GABA_A-benzodi-

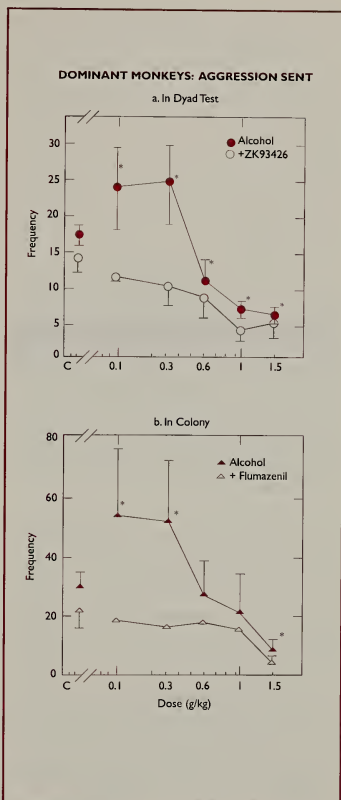


FIGURE 4

A. Effects of alcohol (EtOH) and ZK 93426 (3 mg/kg) pretreatment on aggressive threats and displays in dominant male squirrel monkeys ($n = 6$) in dyadic confrontations. B. Effects of EtOH and flumazenil (10 mg/kg) pretreatment on aggressive threats, grasps, and displays in dominant male squirrel monkeys ($n = 5$) directed toward untreated group members. * $p < 0.05$ compared to vehicle control. ** $p < 0.05$ compared to vehicle control and the same dose of EtOH alone. Reprinted from Weerts et al. 1993b.

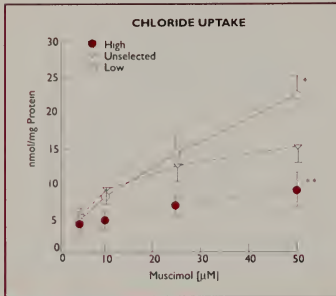


FIGURE 5

GABA-dependent chloride uptake. Cortical synaptoneurosomes were treated with muscimol (1–50 mM) and $[^{36}\text{Cl}^-]$. Results are mean \pm SEM ($n = 3$) for each muscimol dose. * $p < 0.05$ compared to high-aggressive and unselected lines. ** $p < 0.05$ compared to low-aggressive and unselected lines. Reprinted from Weerts et al. 1992.

azepine receptor and the propensity to initiate aggressive behavior. It would be interesting to delineate the functional state of the GABA_A-benzodiazepine receptor complex in animals that show alcohol-enhanced aggressive behavior.

Small amounts of pharmacologically active benzodiazepines have been located in the brain (Guidotti 1978, 1991; Haefely 1988). For example, diazepam binding inhibitor (DBI) is composed of two octadecapeptide sequences that reportedly produce inverse agonist activity. When microinjected directly into the brain ventricles the octadecaneuropeptide (ODN) derived from DBI increased offensive and defensive aggression in male mice in resident-intruder confrontations (Kavaliers and Hirst 1986). ODN dose-dependently increased both the tendency for, and inten-

sity of, attacks in resident mice. These effects were blocked by the benzodiazepine receptor antagonist flumazenil. Recent human studies in male alcoholics indicate that higher concentrations of the proposed endogenous benzodiazepine receptor ligand, DBI, in CSF are correlated with Type 1 alcoholism (for review see Lister and Nutt 1988). Type 1 alcoholism is also associated with anxious personality traits.

The recent evidence on alterations in the GABA_A-benzodiazepine receptor function produced by selective breeding for aggressive behavior and antagonism of the proaggressive effects of alcohol at this site suggests an interactive role for alcohol and the GABA_A-benzodiazepine receptor complex. It is possible that the GABA_A-benzodiazepine receptor complex is susceptible to genetic predisposition and social experience that determine the individual response to the aggression-heightening and aggression-reducing effects of alcohol. However, the clinical potential of benzodiazepine receptor antagonists and partial agonists in the diagnosis and treatment of individuals with the propensity to engage in aggressive and violent behavior remains to be defined.

Steroids

The testes have been known for many years to exert a certain measure of regulatory control over the aggressive behavior of animals. The weakening of aggressive behavior—as well as the decrease in libido—seen in farm animals after castration is well known by those in animal husbandry. This was actually the subject of the first formal published experiment in

endocrinology. Berthold (1849) described the ability of testes transplanted into castrated fowl to restore aggressiveness to these fowl. More modern laboratory research with male mice has identified testosterone (or its metabolites) as the gonadal hormone that affects the probability of their aggressive response to other males (Beeman 1947; Luttge and Hall 1973). Whether this is also the case in humans is far less certain. However, the opposite relationship—the ability of experience and environment to alter testosterone levels—has been repeatedly demonstrated in men (Mazur 1983).

Given the possible role of testosterone in aggression, is it possible that the effect of alcohol on aggression may involve testosterone as an intermediary? Just such a relationship has been hypothesized (Mendelson and Mello 1974). However, the best evidence for an interrelationship between alcohol and testosterone centers around the inhibitory effects of alcohol on testosterone levels. For example, it has been shown that the synthesis, release, and metabolism of gonadal hormones, particularly testosterone, are altered by alcohol abuse (Cicero 1981; Van Thiel et al. 1988). In addition, long-term alcoholics are known to sometimes have testicular atrophy, feminization, and reduced testosterone but often normal levels of luteinizing hormone (LH) and plasma cortisol (Mendelson and Mello 1974; Cicero 1981). This is not likely to be related to nutritional deficiencies in that similar endocrine changes occur in rats receiving chronic administration of alcohol (Van Thiel et al. 1979). It is still possi-

ble that alcohol might alter aggression through its effects on some aspect of hormone synthesis, receptor activation, and/or metabolism. However, given the direction of the effect on testosterone during alcohol abuse, it seems unlikely that episodes of increased aggression in chronic abusers of alcohol can be explained on the basis of steroidal mechanisms (Coid 1982). In fact, the data might better be viewed as a possible contributing factor to the association of alcohol abuse and being the victim of violence (Virkkunen 1974a; Abel et al. 1985).

Studies on the effects of acute alcohol administration have provided important insights into the actions of alcohol on steroid hormones. For example, Badr and Bartke (1974) described a dose-dependent decrease in testosterone levels of mice following administration of alcohol. This effect of alcohol appears to be exerted at the level of the hypothalamus and testes rather than on the pituitary. For example, alcohol reduces androgen synthesis in rats (Cicero et al. 1980). In addition, acute alcohol can also alter LH release by changing hypothalamic secretion of gonadotropin releasing hormone (GnRH) (Cicero et al. 1980).

Our laboratory has been examining the possibility that alcohol and testosterone might have interactive effects on aggressive behavior of animals. We have controlled for the effect of alcohol on testosterone levels by using castrated mice with various levels of testosterone replacement (DeBold and Miczek 1985). As can be seen in figure 6, castrated mice that received 7.5-mm silastic capsules of testosterone subcuta-

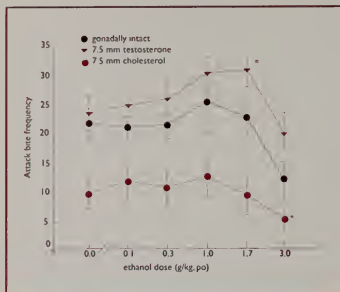


FIGURE 6

Mean (\pm SEM) frequency of attack bites by gonadally intact male mice and castrated mice with subcutaneous silastic capsule implants of testosterone (2.5 or 7.5 mm) or cholesterol (7.5 mm) and receiving 0.0, 0.1, 0.3, 1.0, 1.7, or 3.0 g/kg ethanol p.o. Attack bites were directed by treated residents at intruder mice in a 5-minute trial. * $p < 0.05$ compared to 0 g/kg ethanol control animals. Reprinted from DeBold and Miczek 1985.

neously are more sensitive to the aggression-enhancing actions of moderate doses of alcohol (1.0-1.7 g/kg) and less sensitive to the aggression-suppressing effects of high doses (3 g/kg). In fact, the aggression-enhancing effect was more robust than that generally seen in gonadally intact mice. This is evidence that testosterone can alter one of the behavioral effects of alcohol; it also demonstrates that alcohol can still affect aggressive behavior even when testosterone levels are controlled. It is unlikely that these changes in aggression are due to androgen effects on alcohol metabolism since testosterone appears to decrease alcohol clearance (Cicero et al. 1980; Rachamin et al. 1980).

A similar interaction between testosterone and alcohol can be seen in male

squirrel monkeys. This species has a mating season that lasts for about 3 months each year. During their mating season the body weight of dominant monkeys increases by 20 to 30 percent, the intensity and frequency of sexual and aggressive behavior may double, and pronounced increases in levels of testosterone occur. At other times of the year dominant and subordinate monkeys have equally low testosterone, but dominant monkeys are still aggressive. We have given male squirrel monkeys alcohol during both phases of the annual reproductive cycle. Low doses of alcohol (0.1, 0.3 g/kg, p.o.) increase the frequency of aggressive displays by dominant, but not subordinate, male monkeys during the mating season. However, during the nonmating season, when testosterone and baseline levels of these behaviors are reduced, alcohol had little effect on aggressive behavior of either dominant or subordinate monkeys. If testosterone levels in subordinate squirrel monkeys are increased with subcutaneous injections of testosterone propionate, this does not increase social or agonistic behavior. However, those testosterone-treated subordinate monkeys did show increased frequency of aggressive behaviors after low to moderate doses of alcohol (0.1, 0.3 g/kg, p.o.). Even when elevated by alcohol, the frequency of aggressive displays by testosterone-treated subordinate monkeys was lower than that exhibited by dominant monkeys, but the pattern of alcohol effects was comparable in both types of monkeys.

It is apparent that social factors continue to control aggressive behavior of

monkeys within the group, even after profound physiological and pharmacological treatments. It is also intriguing that there is some evidence that athletes taking high levels of steroids may occasionally become violent after intoxication (Bjorkqvist et al. 1986; Conacher and Workman 1989).

We have tested whether this alcohol/testosterone interaction is mediated by sites within the brain by examining the alcohol response of castrated mice with intracerebral testosterone implants (Lisciotto et al., in press). This technique limits the androgen exposure to defined brain regions, with minimal leakage into the general circulation. We have found that testosterone implanted into the septum, but not the striatum, of castrated mice resulted in a pattern of alcohol response that was similar to that of males receiving systemic androgen replacement. Septal implants of testosterone were more effective in restoring male aggressive behavior than implants in the medial preoptic area (mPOA) or striatum. In addition, the mice receiving testosterone in the septum also showed a lack of suppression of aggressive behavior at the high dose of alcohol as we had seen after systemic testosterone. However, their aggressive behavior was not significantly enhanced at the moderate doses of alcohol. Alcohol had only suppressive effects in the mice receiving testosterone in either the mPOA or striatum. Thus, the septum appears to be an important site for testosterone mediation of aggressive behavior. Moreover, testosterone limited to the septal forebrain is sufficient to alter sensitivity to the aggression-suppressing

effects of high doses of alcohol. These results demonstrate that the interactive effects of testosterone and alcohol on aggression occur centrally and that the septum is a particularly important site for this interaction.

The mechanism for this central interaction is not certain. Most effects of steroid hormones on their peripheral or neural target cells are exerted through their binding to specific intracellular receptors. For example, the effects of estradiol on the female reproductive tract and on sexual behavior require steroid binding to cytosolic estrogen receptors which then alters gene expression. However, there are a few instances in which it is clear that steroid effects do not appear to involve genomic actions. For example, some progestins can have rapid nongenomic effects within the CNS on neuronal excitability (Smith et al. 1987; Havens and Rose 1988). Recently a second mechanism for steroid action has been proposed via the GABA_A-benzodiazepine receptor complex (Majewska et al. 1986; Gee et al. 1987). The evidence for this comes mainly from in vitro biochemical studies. It has been demonstrated that some steroids inhibit ³⁵S-TBPS (*t*-butylbicyclopentylphosphorothionate) binding to the GABA-operated Cl⁻ channel (Majewska et al. 1986; Vincens et al. 1989), potentiate GABA effects on Cl⁻ flux (Im et al. 1990), and increase flunitrazepam binding (Majewska et al. 1986). It is not certain where it is on the GABA_A-benzodiazepine receptor complex that steroids act. Steroids do not appear to directly activate the GABA_A receptor except at very high

concentrations (Gee et al. 1987; Im et al. 1990), and most do not bind to the barbiturate site (Peters et al. 1988; Turner et al. 1989). However, a number of studies agree that there is a steroid recognition site on the complex with structural specificity (Harrison et al. 1987; Gee et al. 1988; Im et al. 1990). In addition, at least some steroids (e.g., dehydroepiandrosterone sulfate) can also bind to other membrane components (Demirgoren et al. 1991).

One of the classes of steroids that can alter the GABA_A complex (i.e., enhance ³H-muscimol binding) are the 5 α -reduced unsaturated A-ring androstanes (Simmonds et al. 1984). This class includes dihydrotestosterone, a steroid which has been shown to modulate TBPS binding in the presence of GABA (Gee et al. 1987). It is generally thought that the effects of steroids in regulating aggressive behavior in male animals requires action at intraneuronal cytosolic receptors. However, it is not yet known whether the ability of testosterone to alter the effects of alcohol is due to androgen action at its cytosolic receptor or at the GABA_A complex. We have recently demonstrated that 5 α -dihydrotestosterone also enhances alcohol action on aggression in mice (DeBold and Miczek 1991).

In addition to steroids directly interacting with GABAergic synapses, there is some evidence that androgens can affect serotonergic systems. As has been previously discussed, this neurotransmitter can be important in the expression of certain types of aggressive behavior (Miczek and Donat 1989). Moreover, alcohol stimu-

lates the release of 5-HT in at least some brain regions (Imperato and Angelucci 1989; Yoshimoto et al. 1991). This action of alcohol has been proposed to be mediated via 5-HT₃ receptors (Carboni et al. 1989; Wozniak et al. 1990). There is also evidence that testosterone has a regulatory role in serotonergic systems. For example, testosterone decreases ligand binding at 5-HT₃ receptors in the amygdala of castrated male rats (Mendelson and McEwen 1990). Thus, there is evidence that alcohol acts on systems that are regulated by testosterone. It is possible that testosterone's ability to alter sensitivity to the aggression-suppressing properties of alcohol occur through actions on common systems, systems that are known to play a role in the mediation of aggressive behavior.

In sum, the research reviewed demonstrates that the effects of alcohol on aggressive behavior may be mediated by a number of neurochemical systems. We have focused here on GABA, 5-HT, and steroids because these systems appear critical for alcohol's effects on aggressive behavior. As has been amply demonstrated, these systems are composed of intricate neurochemical and neuroanatomical differentiated subsystems that interact with each other and with other amines, peptides, and steroids in brain. The exact mechanisms of the interaction between alcohol and these neurobiological substrates is still being determined. However, how exactly these interactions relate to the important problem of alcohol and human violence awaits considerably more cogent experimental verification than is available at present.

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Alcohol-Related Violence: Psychological Perspectives

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INTRODUCTION

A decade ago, when I reviewed psychological research for a multidisciplinary conference, sponsored by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), on "Drinking and Disinhibition" (Lang 1983), I anticipated that the meeting would stimulate rapid development of new avenues to a more complete understanding of how drinking is related to social behavior in general and to aggression in particular. That probably naive expectation was not fully realized. The meeting was quite interesting, but perhaps its participants were not circumspect enough, for an unexpected consensus seemed to evolve rather quickly—that social learning provides the fundamental explanation for the association between alcohol and aggression. The rationale was that groups of people, ranging from whole societies to dyads, sometimes collude in the understanding that drinking provides a "time out" from normal restraint, a mechanism for "deviance disavowal," or simply a viable excuse for otherwise inappropriate behavior. My own somewhat polemic presentation echoed

this message, emphasizing the role of socially acquired expectancies as pivotal in the relationship between drinking and aggression. Accustomed to skepticism from biomedically oriented colleagues and others who favor a more pharmacological explanation, I was gratified by the unusually warm reception my views received. In retrospect, I think that I—and evidently other participants as well, judging from the slow pace of progress in the field—may have unwittingly used the conference to bolster a somewhat limited perspective, fortifying it with impressive-sounding, multidisciplinary references. Perhaps the excitement over shared viewpoints voiced by people from diverse disciplines overshadowed the need to address critical issues in any integrative theory of how drinking and violence are linked. For example, somehow lost in the energetic discussion of social science constructs was the problematic question of exactly why and how alcohol specifically acquires its reputation as a disinhibitor and what moderates or mediates its operation at the individual level when it does cause disinhibition.

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Thus, while we criticize the general public and certain parochial professionals for their frequent willingness to embrace simplistic models of behavior, we too must be wary of our own subtle biases. Without such caution, we again may face stagnation of the little that we know about the alcohol-aggression link. One-dimensional explanations, however multidisciplinary, are probably no more tenable than unabashedly simplistic ones. I offer this bit of introspection, public confession, and admonition in the hope that it will help avert a repeat performance for me and any others who might be similarly afflicted. Accordingly, this time I will endeavor to call attention to issues and inconsistencies in existing psychological research literature rather than attempting to draw glib generalizations from it.

OVERVIEW

Contemporary theoreticians seem willing, if not eager, to discard the notion that much of human action is the result of single, discrete causes. Especially in the study of social behavior, there is at least "lip service" to the idea that most acts are multiply determined, often by conditional and/or interactive factors best conceptualized as continuous variables. Thus, classic disputes like the "nature-nurture" controversy are now more likely to be framed in terms of relative contributions than as "either/or" propositions. Even the sometimes conservative biomedical community seems to have embraced a medical model that reflects the potential role of diverse biopsychosocial factors as both causes and consequences of illness (cf. Engel 1977).

The challenge, of course, is to integrate the divergent elements, each the domain of particular disciplines with unique perspectives and biases, into a really meaningful working model. I will not tackle this daunting task but will simply outline a crude framework in which the critical components can be considered.

There is no question that human social behavior is complex, and there appears to be some consensus in scientific circles that its determination is usefully conceptualized in terms of person \times situation interactions. The person construct here encompasses genetics, physical condition, learning history, personality, and other individual-difference characteristics. The situation construct refers to both proximal and distal aspects of the physical, social, economic, and cultural contexts in which behavior occurs. Where alcohol is involved, this paradigm can be expanded to an agent \times host \times environment interaction, in which alcohol is obviously the agent construct, the person is the host, and the environment is the situation.

As if person \times situation combinations determining social behavior were not complicated enough, the introduction of alcohol would be expected to add higher order interactions to behavioral determination—unless, of course, the action of alcohol is so powerful that its specific impact reliably overwhelms that of all other variables. Such special impact might be the rule if the outcome of interest is a drunken stupor. However, if the focus is on social behavior, then alcohol's effects—which are in part a function of dose level and manner of intake—should

produce even greater variability in behavior as such effects interact with person and situation variables. This seems especially likely because available evidence indicates that the pharmacological consequences of alcohol for neurophysiological and endocrine functions thought to be most relevant to social behavior are diffuse, nonspecific, and variable (even reversible) across the dose-response curve (Berry and Brain 1986).

Given these facts, how could behaviors occasioned by drinking ever come to be viewed in simplistic, direct-cause terms? One answer may be found through an examination of the basis for the social meaning of drinking and for beliefs about the specific behavioral consequences of alcohol consumption. Another is suggested by reflection upon societal pressures for a certain kind of conclusion about whether or not alcohol causes aggression.

Historical analyses indicate that popular conceptions of how drinking affects social behavior are subject to influence by cultural, economic, and political forces that change over time (Levine 1983). It appears that, to the extent that alcohol and the attribution of certain responses to it serve important psychosocial functions, conceptions of drinking that are consistent with those functions will prevail. Even recognizing that the putative "disinhibition" of social behavior by drinking is by no means universal, either across eras or cultures (cf. MacAndrew and Edgerton 1969), we are still locked in a particular temporal and social context and hence are subject to its biases. Another factor that

might have deflected attention from the limited number of sophisticated multivariate analyses of the alcohol-aggression nexus is the eagerness of the general public and of adversaries in the criminal justice system for a clear-cut answer to the causal role of drinking in violence. Because of the importance of the issue, "experts" are frequently called upon to give an opinion as to whether or not alcohol can cause aggression. Under such compelling circumstances, answers riddled with caveats and reservations due to the complexity of the problem often erode confidence in the expert and eliminate future requests for opinions. Thus, popular demand may have fueled undue investment in the simplistic, direct-cause models of association that underlie most alcohol-aggression research.

Realistically, however, such an approach can be expected to yield little more than broad, probabilistic conclusions that do not identify specific features of the people or events to which findings might be generalized. (See Greenberg 1981 for a detailed critique of the vaguely defined research questions and weak methodologies that characterize the drinking and crime literature.) Unless this misguided course is abandoned, there is little hope that we will ever be able to respond meaningfully to calls for scientific help in dealing with the real-life complexities of unique instances of behavior in order to arrive at appropriate recommendations (e.g., punishment versus treatment). Instead, we will continue to be faced with the option of either exaggeration of the extent of our knowledge and of

the legitimacy of our subjective opinions about the alcohol-aggression link or the likelihood that we will not be taken seriously because we have nothing definitive to say. All too often it seems "experts" have chosen the first alternative and perpetuated the attendant myths.

With these biases and pressures in mind, let us turn to the empirical literature on alcohol and aggression. In doing so, I hope to promote the view, shared by many others, that progress in understanding the effect of drinking on behavior will be greatest if the pursuit of generalizations that apply to all drinking by any person in any situation at any time is abandoned. Instead, emphasis should be placed on determining when, for whom, and under what circumstances will a particular quantity and kind of drinking alter the nature and probability of a specific social behavior.

THE LITERATURE ON ALCOHOL AND AGGRESSION

As other papers in this volume representing biological, sociocultural, and economic approaches have outlined the evidence and perspectives of their particular disciplines, I will proceed immediately to a discussion of two broad classes of social/clinical psychology research. The first includes a sampling of mostly nonexperimental studies designed to assess (1) beliefs and expectations about how drinking affects behavior, (2) observer perceptions of intoxicated persons, and (3)

attributions of causality in situations where drinking and aggression cooccur. The second class of research selects only experimental studies in which a beverage is manipulated and a behavior assumed to be an indicator of aggression (or of direct relevance to it) is measured. In both areas, an effort will be made to include studies pertinent to aggression in general and, where possible, to sexual aggression as an important, specific subtype.

Before commencing with the review portion of the paper, some additional restrictions and definitions need explication. First, the drinking variable is to be evaluated in terms of episodes of acute intoxication rather than chronic problems labeled as "alcoholism" or the like. Second, for the sake of simplicity, I will adopt a fairly broad definition specifying that aggression is the intentional (nonaccidental) direction of a presumably noxious stimulus toward another person who is thought to be motivated to avoid it. The type of aggression discussed here, whether verbal or physical, is typically active and direct. Finally, because the experimental literature on alcohol and aggression is now so voluminous and has been, at least in part, the object of two recent meta-analyses (Bushman and Cooper 1990; Hull and Bond 1986) and numerous other reviews, it will be given a somewhat more general and limited coverage, with emphasis on methods and issues, whereas the nonexperimental literature will be reviewed more thoroughly.

STUDIES OF EXPECTANCIES, PERCEPTIONS, AND ATTRIBUTIONS ABOUT ALCOHOL AND AGGRESSION

Methodological Issues

For a variety of reasons, most investigations of people's expectations, perceptions, and attributions about alcohol and aggression rely heavily on self-report. There are obvious liabilities to this type of measure, especially in the context of survey research, which, of course, has its own limitations. Many key methodological issues are raised in connection with the research overview that follows, but two aspects of sampling deserve special mention. The first is subject sampling.

Although most surveys in this area continue to rely on convenience samples such as university students or alcoholics in treatment, it is noteworthy that the general population—including adolescents and even some children—has been studied. Moreover, contrary to much prior alcohol research, female respondents have been well represented in nearly all of the surveys. As discussed below, subgroups of subjects sometimes report different expectancies, perceptions, and attributions, but on the whole there is a remarkable consensus across diverse samples that alcohol intoxication is associated with greater aggression.

This is not to say, however, that there is agreement that alcohol causes increased violence in everyone in every instance or that intoxication consistently modifies culpability for aggression. Indeed, the other methodological issue deserving spe-

cial comment is the probable inadequacy of content sampling. Questions about alcohol-aggression expectations tend to be quite broad, often failing to identify potentially crucial aspects of the target for whom the expectations are held (e.g., self versus others, male or female), the type of drinking involved (e.g., dose), or particular kinds of aggression to be considered (e.g., sexual versus nonsexual). In contrast, vignettes typically used to probe perceptions of blame and attributions of causality may be too specific and limited in their content and coverage, failing to do justice to all the subtle aspects of the agent, host, and environment that could contribute to such judgments. It would appear that future research must do a better job of managing these potentially critical subject and content sampling variables, including analysis of their possible interactions with each other.

Cognizant of some of its limitations, let us now turn to the available evidence on how people think about alcohol and aggression.

Expectancies

"Expectancy surveys" that address beliefs about the connection between alcohol and aggression in general and selected populations constitute the first type of research to be reviewed. The objective of such studies is to determine the nature of prevailing sociocultural beliefs relevant to drinking and violence, and sometimes to determine how these expectancies might vary as a function of person or situation.

Two different meanings that the term "expectancy" can assume should be iden-

tified in this context. First, there are *alcohol-response expectancies*, comprising the domain of beliefs people hold about the direct effect that alcohol will have on a drinker's behavior. Thus, alcohol-response expectancies reflect beliefs about the intrinsic powers of alcohol as a pharmacological agent with specific biobehavioral actions, one of which may be increasing aggressiveness.

The second category of expectations can be described as *response-outcome alcohol expectancies*. These are beliefs about how the fact that an individual is intoxicated changes the way others evaluate his or her behavior. The role of these indirect effects of drinking, that is, alterations in the psychosocial consequences of behaviors because they are coincident with alcohol use, has been largely neglected in the alcohol-aggression literature. Yet, the fact that such response-outcome expectancies reflect intrapersonal and interpersonal standards, sociocultural norms, and specific situational constraints makes them quite germane to the drinking and violence relation. This is because expectations and tolerance of greater deviance in those under the influence of alcohol should increase the likelihood of a positive correlation between drinking and aggression.

A popular belief that alcohol intoxication produces or facilitates aggressive responding and/or reduces the accountability of perpetrators of violent acts could have profound implications. Victim decisions to report; law enforcement decisions to arrest; criminal justice decisions to prosecute, plea bargain, or divert; jury decisions to convict; judicial

decisions to sentence; and parole board decisions to release could all be influenced. The outcomes of these decisions could, in turn, affect the incidence of alcohol-related aggression, increasing the rate if drunkenness were widely viewed as a viable explanation or excuse for misconduct. In point of fact, Federal and State law in the United States currently allows intoxication per se as a defense only in limited instances of criminal behavior and permits consideration of alcohol involvement as a partial defense or exceptional circumstance in a few others. It is, of course, often difficult to establish any alcohol defense in an objective, formal sense (see Critchlow 1983; Epstein 1978; Massey 1989). For our purposes, suffice it to say that sociocultural interpretations of causality in the alcohol-aggression nexus may well supersede the written law in many instances. Thus, it is important to know the alcohol expectancies people hold and hence the perceptions they will have and attributions they will make about alcohol-related violence.

Probably because of easy access to research subjects, the expectations of university students are among the best-documented examples of adult beliefs about the effects of alcohol on aggressive responding as well as on a whole host of other behaviors and emotions (e.g., Brown et al. 1980; Southwick et al. 1981). General population studies have tended to produce convergent results (e.g., Roizen 1983). The modal respondent in either type of study held the opinion that drinking can specifically increase interpersonal aggression. It was also thought to stimu-

late a sense of power related to dominance behavior and, more broadly, to "bring out the worst in people." Of course, these were not the only alcohol-response expectancies people expressed—there were many positive ones as well—but they did appear quite consistently. Indeed, even in other surveys focusing on the perceived causes of crime, alcohol (and/or other drugs) is among the causes mentioned most frequently (e.g., Kidder and Cohn 1979).

No expectancy surveys specifically address the impact of alcohol on sexual aggression, but in the surveys already mentioned it was consistently found that drinking is thought to promote freer sexual expression. It is not always clear whether this effect is regarded as positive or negative, but evidence of and concern about a close connection between alcohol consumption by both victims and perpetrators in acquaintance rapes continues to increase (Abbey 1991; Ehrhart and Sandler 1986). Dramatic incidents in which intoxicated men apparently took advantage of alcohol as a means of overcoming women's sexual reluctance (e.g., Martin and Hummer 1989) have focused attention on how drinking by prospective sexual aggressors might increase their boldness, while drinking by potential victims might alter observers' perceptions of their sexual motives and availability (also see discussion below).

Developmental studies further indicate that the expectation of increased aggressiveness as a function of drinking does not require personal experience with intoxication. Lang et al. (in preparation)

found that children aged 5 to 12 anticipated more negative/aversive actions (e.g., more yelling, inappropriate punishment, and general meanness) from adults who had a lot of alcohol to drink than from the same adults when sober. Likewise, Christiansen et al. (1982) noted that adolescents without prior drinking experience expected alcohol to produce increases in personal power, including dominance and aggressiveness. These kinds of studies suggest that observational learning may play a part in the alcohol-aggression relation.

Despite the appearance of public consensus about an expected alcohol-aggression connection, it must be remembered that such conclusions are merely generalizations based on aggregate data. Furthermore, these data often may not represent U.S. culture very effectively, let alone other cultures where differences may be substantial. In a multisample structured means analysis of alcohol-aggression expectancies in eight countries, Lindman and Lang (in press) found an overall expectation that alcohol increases aggressiveness, but with marked cross-cultural variations in the strength of this belief. These variations included, for example, significantly stronger expectations of violence after drinking among Spanish as opposed to French respondents, despite similar patterns of alcohol consumption.

Even within cultures, more refined analyses tend to reveal considerable variation in expectancies as a function of characteristics of both agent and host. Thus, expected effects have been shown to vary according to the alcohol dose (Southwick

et al. 1981) and the type of beverage in which alcohol is imbibed (Lang et al. 1983); high doses and distilled spirits, more than low doses or wine and beer, were associated with greater expectations of aggression. There are also differences depending upon the respondent and the target person to whom the expectation is being applied.

Perhaps not surprisingly, people consistently expect that they are less susceptible to the adverse effects of alcohol than others are (Gustafson 1987a; Leigh 1987; Rohsenow 1983). This is important because even if one is not personally disposed to be more aggressive when drinking, the expectation that others are may lead to a greater perception of threat or fear of attack in contexts where others are drinking. This might make an individual more wary and less provocative in drinking situations, although anecdotal evidence does not always seem to bear this out. Of course, it is possible that only certain "others" are expected to show greater aggression when drinking, but efforts to identify just who those others might be have been limited to examination of differences in expectations as a function of target gender (see below). More investigation of this question might be helpful in sorting out individual differences expected to predispose other people to intoxicated aggression.

Additional potentially important moderators of alcohol expectancies are the drinking histories and habits and other sociodemographic characteristics of the respondents. Cameron (1981) found drinkers were more likely than abstainers

to believe alcohol is a factor in violent crime. Brown et al. (1980) also reported that heavier drinkers (a group predominated by men) had more specific alcohol expectancies, including increased aggression, than lighter drinkers and women. However, most other research has shown that heavier drinkers do not expect aggression to be a salient feature of their own alcohol use (e.g., Roizen 1983). Orcutt (1978) even found that the more a person drank and the more those close to him or her drank, the less likely the expectation that alcohol use would be seen as a cause of aggression, crime, immorality, or loss of control. He further noted that these beliefs were held despite the fact that heavier drinkers have been found to have elevated levels of personal experience with fights and similar negative events in connection with intoxication.

It may be that the greater exposure of heavy drinkers to negative alcohol events is simply a consequence of the fact that they have greater exposure to all kinds of alcohol events because they are intoxicated more frequently and for longer periods of time. Heavy drinkers' emphasis on positive effects relative to negative ones could also be a matter of perceptual bias, reflecting greater tolerance of deviance, be it excessive drinking or interpersonal aggression. Perhaps less emphasis on negative alcohol outcomes and accentuation of positive ones is little more than a rationalization for continued heavy drinking. Consider, for example, the report of Tamerin et al. (1970): although nearly all of the male alcoholics in the study argued that they drank to feel better and be more

sociable, they grossly underestimated the aggressiveness they actually exhibited while intoxicated. It is noteworthy, however, that many of these same alcoholics claimed amnesia regarding their alcohol-related aggression. Therefore, their distorted expectancies could have been due to memory deficits. Speculative as any of these explanations may be, it appears that alcohol-response expectancies, whether veridical or not, vary as a function of drinking experience. Even within the "heavy drinking" group, there may be variations depending upon whether or not diagnostic criteria for an alcohol use disorder are met. Such individual differences deserve further attention in any effort to explore the alcohol-aggression link, especially in light of the high comorbidity of alcohol use disorders and antisocial behavior regardless of alcohol's presumed causal role.

Another variable of some potential importance to alcohol expectancies relevant to violence is the gender of the respondent. As suggested above, systematic differences in respondent drinking level as a function of gender represent potential confounds in the few sex-difference analyses that have been conducted and may have led to reports of effects that were in fact spurious. Thus, when Rohsenow (1983) controlled for the drinking habits of her respondents, she found that men and women were equally likely to expect alcohol to increase aggressive behavior. This does not necessarily mean, however, that people do not hold different expectations for the behavioral effects of drinking in men and women.

Perceptions of Intoxicated Persons

I have already noted that survey respondents expect alcohol to increase the aggressiveness of other people. There are also indications that female raters anticipate a stronger effect on dominance behavior if the target other is a male (George and McAfee 1987). This latter finding may be a simple artifact of greater drinking by men, but when coupled with other research by George and his colleagues on the question of how drinking by a woman influences male perceptions of her, greater implications are evident. George et al. (1988) used vignettes depicting a young man and woman in a dating situation and systematically varied their drinking behavior. They found that a woman who was portrayed as drinking alcoholic beverages was rated as more sexually available and more likely to engage in sex play and intercourse than a woman said to be drinking only cola. The male date described in these vignettes was thought to be especially likely to hold such differential expectations of his partner's alcohol-induced sexual disinhibition. The potentially synergistic combination of alcohol expectancies for greater male aggression and perceptions of intoxicated females as sexually receptive could account for much of the apparently strong connection between drinking and date rape.

Attributions About Alcohol-related Violence

Given that drinking and aggression are both expected to be and apparently are often coincident, what kinds of causal attributions do people make about this connec-

tion and what implications do they have for assignment of responsibility/blame and accountability/punishment? This question is fundamental to the social learning conceptualization of alcohol and aggression. In order for drinking to function as a "time out" or means of "deviance disavowal" that exonerates the offender there must be at least an implicit social contract. That is, others must accept intoxication as an excuse or explanation for antisocial behavior. I have already noted that the legal system provides limited support for this contract, but what do samples of the general and special populations think?

In an early study of the general population, Sobell and Sobell (1975) found that although only a third of respondents believed that persons who were legally drunk were "in control" of their actions, more than half thought that they were "responsible" for consequential behaviors, and fully 92 percent indicated that intoxicated persons should be held fully "accountable" for their behavior. Moreover, a substantial proportion of respondents believed that drunken perpetrators of violent crimes should receive more severe penalties than would usually be given for the offense, and few argued that intoxication justified reduced punishment. Obviously, such an outcome does little to support the excuse value of drinking. Other more experimental and clinical studies exploring attributions about the interaction of alcohol and violence, particularly violence against women, have yielded equivocal results.

Richardson and Campbell (1980) manipulated husband and wife intoxica-

tion in vignettes used to present an incident of wife abuse to male and female subjects. Portrayals of the husbands as intoxicated tended to reduce the relative responsibility or blame subjects assigned to him. But, if the wife was described as intoxicated, the perception that she contributed to the abuse incident increased. A conceptual replication of this paradigm, using rape rather than spouse abuse as the crime of violence, produced similar results (Richardson and Campbell 1982). However, Dent and Arias (1990) found that alcohol consumption by perpetrators of marital violence did not influence evaluations of them, although drinking by the victim did seem to legitimize the abuse to some extent.

In vignette studies of alcohol and more general forms of interpersonal violence, the findings are also mixed. Critchlow (1985) reported that less personal causation and blame were assigned to intoxicated offenders than to sober ones, but suggested punishments were not affected. A more recent study by Aramburu and Leigh (1991), on the other hand, indicated that intoxication led to greater blame for both the aggressor and the victim, perhaps reflecting increasing societal disapproval of drunkenness regardless of circumstances.

Thus, at least in the context of the abstract incidents captured by vignette studies, there appears to be uncertainty about whether drunken perpetrators will be blamed more or less than sober ones and no evidence whatsoever for diminished punishment of intoxicated offenders, regardless of blame assignments.

Drunken victims, on the other hand, consistently seem to elicit less sympathy than sober ones even to the point where they are held partly responsible for their victimization. Inasmuch as at least some studies (e.g., Fillmore 1985) suggest that victims of violent crime are nearly as likely as perpetrators to be intoxicated, perhaps more attention should be directed to people's expectations about how drinking affects their risk for victimization. In any case, abstract vignette studies provide little support for the hypothesis that intoxicated aggression is likely to be socially reinforced, except perhaps in cases where victim intoxication may spread the blame. The story may be somewhat different, however, in cases where the victim and perpetrator are intimates and the respondent is the actual victim.

Good clinical case study data on victims' attributions are difficult to obtain because immediate efforts to minimize their sense of blame are part of standard treatment regimens in cases of rape, assault, and the like. However, some investigators of spouse abuse (e.g., Dobash and Dobash 1979; Gelles 1974) have reported not only that wife beaters are liable to try to explain their behavior by attributing it to alcohol, but also that wives often accept this excuse and report that it is drinking rather than violence that is the main problem. This theme of female acceptance of alcohol as an explanatory factor in violence by males has already been repeated in several contexts in this review and thus might warrant further exploration.

Theories seeking to account for gender-specific alcohol expectancies, percep-

tions, and attributions have typically stressed sociocultural factors, and probably with very good reason (e.g., Critchlow 1985; Lang 1983). Nonetheless, it is not outside the realm of possibility that men are indeed more vulnerable to an alcohol-aggression effect, perhaps for biological as well as psychosocial reasons. There is evidence to suggest that genetic vulnerability to alcoholism and many other behavioral disturbances, including antisocial behavior, varies by sex.

Finally, surveys of alcohol attributions in offender populations should be mentioned. These have mainly been retrospective analyses of the role individuals said alcohol played in the crimes for which they were convicted. In one study of child molesters, McCaghy (1968) reported that about one-third of the men believed they would not have committed their crime had they not been intoxicated at the time. Similarly, Mayfield (1976) found that 58 percent of a sample of assaultive offenders were drinking at the time of their offense, as were 40 percent of their victims, and a substantial minority of these claimed drunkenness as an explanation or excuse. These results are remarkable, not only for the potentially significant role of alcohol in crime that they suggest, but also for the large number of men who did not attribute their aggressive behavior to drinking. The possible psychological, if not legal, advantages of such external attributions are obvious. Why then do many criminals deny that alcohol was a cause of their behavior? Perhaps they do not experience guilt, or simply do not believe that making an excuse would prove helpful.

Alternatively, it is plausible that although alcohol may be involved in many crimes, it is the relatively rare case in which its role is so significant that responsibility and especially punishment for the act should be reduced. Offenders may be as attuned to this possibility as were respondents in the Sobell and Sobell (1975) public opinion survey cited previously. Perhaps we should look more closely at the alcohol expectancies of those who commit violent acts while drinking.

Using Alcohol Expectancies To Predict Alcohol-related Aggression

A few recent survey studies have suggested that individual alcohol expectancies may moderate or mediate the effects of drinking on aggressive and sexual behavior. For instance, Dermen and George (1988) found that after controlling for subject age, dispositional hostility, and attitudes toward aggression, the relationship between self-reported drinking habits and frequency of involvement in alcohol-related aggression increased significantly as a function of the strength of beliefs that alcohol increases aggression. Likewise, Leigh (1990) reported that the proportion of both efforts to initiate and actual involvements in sexual encounters while drinking was predicted by the expectation that drinking disinhibits sexual behavior. These findings suggest that subjects might either derive their expectations from direct experience or that expectations influence the behavioral concomitants of drinking that they experience. In either case, the likelihood of involvement in alcohol-related aggression and perhaps sexual violence

may be somewhat predictable from individual difference variables.

Summary

To summarize, it should be evident without an examination of the scientific literature that alcohol is rarely, if ever, a sole or even a specific direct cause of social behaviors as complex as human aggression. A good deal of violent crime occurs without the aid of drinking, and the vast majority of drinking is not accompanied by violence. Yet, expectancy surveys seem to indicate that observers, perpetrators, and victims harbor both alcohol-response and response-outcome expectations suggestive of the potential contributory role of alcohol in aggression. Much of this relationship is probably situationally determined, but dose, type, and manner of drinking may be influential as well. Of perhaps greater theoretical interest, the existence of substantial individual differences in alcohol expectancies is also consistent with the possibility that the impact of drinking on aggressive behavior varies as a function of the person. Moreover, most people are inclined to expect that alcohol produces more aggression and related negative effects in others than in themselves. In view of a number of studies correlating certain pathological patterns of drinking with a propensity for drunken violence, this may be true for a certain subgroup of individuals (cf. Coid 1982; Leonard et al. 1985).

Unfortunately, it is difficult to sort out the elements of a drinking x person x situation interaction using only correlational analyses of nonexperimental data.

For a clearer determination of the effects of alcohol and alcohol-related expectancies on aggression and crime, let us turn to the experimental literature.

EXPERIMENTAL STUDIES OF ALCOHOL AND AGGRESSION

The expectancy and attributional literature just reviewed appears to be congruent with the presentations of other papers in this monograph that have marshalled an impressive array of evidence indicating that drinking alcohol is indeed associated with aggressive behavior. However, the operative word in the preceding sentence is "associated." Whether the research utilizes genetic data and biological assays, or sociocultural observations, or police records and crime statistics, or economic variables tied to alcohol consumption and violent behavior, the evidence of an association is still invariably correlational. Consequently, notwithstanding remarkable developments in causal modeling and other statistical methods for analyzing correlational data, we must turn to experiments in clinical and social psychology to make more definitive statements about whether drinking actually can, in some sense, *cause* aggression as opposed to being simply coincident with it. Accordingly, the second category of research to be reviewed here consists of controlled experiments designed to go beyond simple correlation in order to examine causal factors in the link between alcohol and aggression.

Methodological Issues

What can we reasonably expect to learn from a laboratory analog study of alcohol

and aggression? It is unquestionably the case that lab settings are artificial and that ethical and practical constraints present in experimentation rule out many methods and measures. This compromises the ecological validity (i.e., mundane realism) of such experiments. However, the extent of external validity (i.e., the extent to which results can be generalized to other samples, settings, and specific behaviors) is not necessarily dependent on ecological validity and is ultimately an empirical question anyway. The purpose of experiments is to test specific causal hypotheses, and in doing so it is the *meaning* subjects impart to the experimental stimulations and to their responses that is vitally important, not ecological validity. Thus, as long as a subject interprets a button press allegedly delivering an electric shock to a fictitious competitor as an act of aggression, it does not matter that he or she has never and will never try to give shocks to people outside the laboratory. Extensive debriefing interviews with subjects, as well as studies of the correlation between lab measures of aggression and both self-report and observational indicators of aggression occurring in the natural environment, support the validity of experimental approaches (Berkowitz and Donnerstein 1982).

Given the above arguments, it is not unreasonable to assume that certain forms of aggression suitable for laboratory investigations share a continuum with violent crime and that drinking may have similar effects on behavior at various points along this continuum. This is not to minimize the incongruence of laboratory and natur-

al settings in which acts of violence normally occur. Lab environments control potentially important mediators/moderators present in the "real world," and hence transfer of predictions may be hazardous. But, to the extent that potentially confounding variables and other factors not germane to the particular causal hypothesis being tested are ruled out, the artificiality of the lab may be seen as a strength.

Although a few alcohol-aggression experiments have involved direct verbal affronts or indirect evaluations of others (e.g., Rohsenow and Bachorowski 1984), the main dependent measures used in most laboratory analog studies rely on the subjects' belief that they are selecting and directly delivering physically noxious stimuli (typically electric shocks) of varying intensity and/or duration to another person. In the Buss (1961) "aggression machine" paradigm, for example, the subject is assigned a teacher role and a confederate of the experimenter a learner role through a rigged "lottery." The subject proceeds to select and deliver shocks for incorrect responses made by the learner in a bogus study of the effects of punishment on learning. This approach has been criticized on the grounds that most subjects believe punishment is detrimental to learning and they therefore minimize aggressive responding (Gustafson 1984) and also because the absence of any retaliation opportunity on the part of the confederate does not faithfully represent most aggression situations. In a recent meta-analysis (Bushman and Cooper 1990) that considered opportunity for victim retaliation as a moderator variable in the alcohol-aggres-

sion relationship, it was shown that effect sizes were significantly smaller in studies where retaliation was not possible.

Partly to combat such criticisms, Taylor (1967) introduced a reaction-time competition task in which subjects believe they are competing with partners, the loser receiving a shock of an intensity set by the winner prior to each trial. In actuality, wins and losses are programmed by the experimenter as are the shock settings of the alleged partner. This latter feature is ingenious in that it permits manipulation of provocation and apparent retaliation. One troublesome aspect of the procedure, however, is that pain thresholds that serve as the basis for scale calibrations must be established for each subject. The putative analgesic effect of alcohol, coupled with the unknown stability of pain thresholds across trials, introduces some uncertainty about just what is influencing subjects' selection of shock intensity in experiments using this procedure (cf. Gustafson 1985, 1989). There is also a question about whether it is the subjects' own intoxication or their beliefs about their opponents' intoxication that influences their perceptions of threat and hence their selection of shock intensities. Schmutte et al. (1979) have argued that the greater expectation of attack reported by intoxicated as opposed to sober subjects reveals an alcohol-induced disturbance of their judgment. However, Gustafson (1986) noted that subjects in these experiments typically assume that their partners received the same beverage treatment that they did. Moreover, in a systematic study of the consequences of

such an assumption, he found that all subjects clearly expected intoxicated partners to be more aggressive and that they also behaved more aggressively toward them than toward sober partners.

As if the subtleties and complexities of measures of general physical aggression in the lab were not problematic enough, consider the difficulty of arriving at a reasonable analog for sexual aggression. The best approximation to date is the measurement of interest in and sexual arousal prompted by exposure to violent erotic materials (e.g., Briddell et al. 1978). Only a handful of studies have attempted to use these indirect approaches in connection with tests of alcohol consumption and sexual aggression.

Of course, it should also be noted that none of the commonly used aggression paradigms have been applied to the study of interactions between people who know each other. This is an important shortcoming because so much violence, intoxicated and otherwise, occurs between acquaintances and intimates.

Assuming that a satisfactory measure of aggression is available, the design of alcoholic beverage manipulations is the next area of concern. Most investigators employ one of a small number of simple paradigms. The alcohol-control design provides alcoholic beverages to some subjects and nonalcoholic beverages to others, with both groups receiving veridical information about the content of their beverages. This approach mimics real life contrasts between drinking and not drinking intoxicating beverages, but it does not control for expectancy effects. In an effort to overcome this

problem, the simple placebo design uses the same beverages as the alcohol-control method, but subjects in the no alcohol condition are led to believe that their drinks contain alcohol. A placebo-plus-control design uses all three of these conditions, thereby permitting a specific test of expectancy effects through comparisons of the placebo and control conditions.

In the most complete approach to beverage manipulation, the balanced-placebo design (Marlatt and Rohsenow 1980) incorporates the three conditions described above with a fourth, "antiplacebo" treatment in which subjects believe they are receiving inert drinks which in truth contain alcohol. Comparing the antiplacebo and control conditions isolates the pure pharmacological action of alcohol, independent of alcohol expectancies. Naturally, placebo and especially antiplacebo conditions are sometimes difficult to execute without arousing the subjects' suspicions and the unpredictable consequences that might accompany them. This is particularly problematic when the effects of high doses are under investigation. Under these circumstances, some investigators (Ross and Pihl 1989) have modified the balanced-placebo design by manipulating expectations of high or low doses rather than attempting to convince subjects in the antiplacebo condition that they had received nonalcoholic drinks. In any case, carefully crafted manipulation checks must be included if meaningful interpretation of the results of such experiments is to be possible.

The few experiments that have successfully carried off variations of the bal-

anced-placebo design have attracted considerable attention because they have sometimes shown that, regardless of its veracity, the simple belief that one has consumed alcohol can increase aggression. This so-called "expectancy effect" has been found for direct physical aggression indexed by both the Buss method (Lang et al. 1975) and a variation of the Taylor paradigm (Pihl et al. 1981). Although a meta-analysis of balanced-placebo studies of aggression (Hull and Bond 1986) found that there was such great heterogeneity in results that neither alcohol nor expectancy reliably affected aggression, it should be noted that the negative studies included atypical samples (women as well as men) and somewhat questionable measures of aggression (e.g., indirect verbal feedback and the use of graffiti). Regardless, expectancy results seem sufficiently numerous and strong to warrant serious consideration of their impact on the relation between drinking and aggression. Clearly, they are not easily reconciled with theories that rely primarily on the pharmacological action of alcohol to explain the relation of drinking to aggression.

In the realm of sexual aggression, the role of expectancy effects appears to be even more powerful, although as noted previously this type of aggression has not been measured directly in the relevant experiments. Nonetheless, it has been shown that perceived alcohol ingestion by men increased their unobtrusively measured interest in viewing violent-erotic photographic slides, even when the drinks were not really alcoholic (George and Marlatt 1986). Moreover, Briddell et al.

(1978) found that both the self-reported and physiologically measured sexual arousal of men listening to tape-recorded depictions of forcible rape and sadistic sexual violence were significantly increased when they thought they had consumed alcoholic beverages—again, independent of actual beverage content. As in the case of general aggression, there have been some null results in tests of expectancy effects on deviant sexual arousal (Barbaree et al. 1983), but the Hull and Bond (1986) meta-analysis showed that the simple belief that alcohol has been consumed can reliably enhance sexual interest and arousal. This effect is especially remarkable because it requires that the psychological mechanisms underlying it must overwhelm the pharmacological action of alcohol to depress the sexual response.

Despite the potential importance of findings from balanced-placebo research, there is no denying the bulk of evidence accrued using other designs. Many of these studies were included in the recent Bushman and Cooper (1990) meta-analysis, which concluded that "alcohol does indeed facilitate aggressive behavior" (p. 350). They also noted, however, that to the extent that specific comparisons were possible, "neither the pure pharmacological effects of alcohol nor the pure psychological effects of alcohol [i.e., alcohol-related expectancies] are important determinants of aggression. It is possible that both effects must occur together for alcohol to cause aggression" (p. 349). Furthermore, they identified a host of methodological factors and moderator

variables that might influence the outcomes of alcohol-aggression experiments. Some of these will be discussed below.

Any laboratory analog experiment to study the alcohol-aggression link must, of course, include specific manipulation of alcohol (the agent), selection of subjects (the hosts or persons), and a set of circumstances affording an opportunity for aggression (the environment or situation). The potential impact of variations in each of these domains needs to be addressed.

Effects of the Agent Alcohol

General design characteristics related to the alcohol variable have already been discussed, but there are many other aspects of the agent to consider. Not only does common sense dictate, but experimental studies confirm, that alcohol's effects on physiological and behavioral outcomes are dose dependent; a similar pattern might be expected for aggression. Expectancy surveys confirm that prospective subjects are well aware of this relationship, but the typical alcohol-aggression experiment has employed a single dose, often well below that documented to be present in alcohol-implicated criminal violence. Among the few exceptions, an early study by Taylor and Gammon (1975) did look at dose-response effects and suggested that very low doses do not increase aggressiveness, whereas moderate doses do. However, no study to date appears to have tested dose effects producing blood-alcohol levels (BAL's) in excess of 0.10 percent.

Another factor worthy of examination is the manner of drinking and the timing of aggression measures. This is due to the

biphasic action of alcohol (initial stimulation of physiology and affect, followed by depression), the phenomenon of acute tolerance (reduced impairment within a drinking session the longer intoxication is sustained), and the differential effects of the same BAL depending upon whether it occurs on the ascending or descending limb of the BAL curve. Again, however, experimenters rarely mimic naturalistic drinking as it might relate to aggression, choosing instead to administer beverages in very limited timeframes that rule out analysis of many known features of blood alcohol/behavioral consequence relationships of potential importance to the effects of drinking on aggression.

In a similar vein, the question of whether it is ethanol per se or the form in which it is taken that is associated with aggression has not been fully explored. Despite systematic differences in respondents' alcohol expectancies as a function of beverage type, the vast majority of alcohol-aggression experiments utilize distilled spirits in rather strong drinks without consideration of subjects' preferred or usual beverage experience. Studies using wine (Gustafson 1990) or beer (Gustafson 1988) as the vehicle for administering alcohol have been decidedly less successful at producing alcohol-induced increases in aggression than those using distilled spirits, despite reasonable comparability in the BAL's attained. This outcome is difficult to explain without recourse to a beverage-specific expectancy model, and just such a model has received some support from a study showing that subjects who consumed or believed they

consumed beer were significantly less aggressive than those who expected or actually drank distilled spirits (Pihl et al. 1984). If these results can be replicated, they represent a formidable challenge to theories of alcohol and aggression that depend exclusively upon the pharmacological effects of ethanol.

Host, Person, or Subject Effects

In the area of possible host effects, we have already seen that subjects with different characteristics (gender, drinking experience, cultural background, etc.) may differ in their beliefs, expectations, and attributions about alcohol and aggression, and it is reasonable to assume that these differences might influence any effects that are observed. Likewise, individual personality dispositions or traits and biologically based variations in reactions to both alcohol and stimuli that might elicit aggression could add variance to the results if they are not adequately controlled or at least measured for use in later covariance analyses. Indeed, one of the most consistent and neglected facts about alcohol and aggression experiments is the great variability of subject response (e.g., Pihl 1983). Only a few studies have examined the role of individual differences.

Inasmuch as there is only one published report of an alcohol-aggression experiment including both male and female subjects, and none using mixed dyads of subjects and confederates, obviously potential gender differences have been neglected. Rohsenow and Bachorowski (1984) reported nonparallel effects of alcohol on verbal aggression in

men and women as part of a complex pattern of results explained away by differences in sex roles and related expectations. Indeed, gender differences are exceedingly difficult to study in this area because males and females may differ in their propensity for, or at least their style of, expressing aggressive behavior (Frodi et al. 1977). They may also react differently to provoking stimuli (Gustafson 1986) and even process alcohol differently. Nonetheless, the frequent involvement of intoxicated women in violent crime would seem to mandate greater attention to how drinking affects their inclination to aggress, even if the findings cannot be compared directly to those of their male counterparts. The way in which drinking by a woman might increase her vulnerability to sexual victimization is also an area of special concern.

Although epidemiological studies seem to suggest that people's drinking levels and aggression levels are correlated, no alcohol-aggression experiment has included drinking history as a factor in its design. However, Bushman and Cooper (1990) attempted to estimate the importance of this variable by examining the effect sizes in studies that have used heavy drinkers exclusively. They found little evidence of a drinking-aggression effect of any kind in these samples, in contrast to the fairly substantial increases observed in moderate drinkers. Perhaps the probably elevated alcohol tolerance present in heavier drinkers, coupled with the low doses of alcohol typically administered in these studies, minimized chances for uncovering any drinking history effect. Or maybe

heavy drinkers are accurate when they endorse mostly positive alcohol expectations and do not report that alcohol increases their aggressiveness. Obviously, more research is needed.

Feldman (1977) has suggested that alcohol serves mainly to potentiate aggression in individuals who already have an elevated inclination to be violent and who find themselves in "aggressible" situations. In essence, this is the hypothesis that the drinking-aggression is due mainly to effects of alcohol on individuals who because of their physiological and/or psychological make up are near the threshold for acting out. Only three controlled laboratory analog experiments seem to have pursued this eminently logical thesis.

The clearest evaluation was by Bailey and Taylor (1991). They used a paper-and-pencil measure to select subjects with high, medium, and low dispositional aggression and then randomly assigned them to a test of the effects of either a moderate alcohol dose or a very low "active placebo" dose on aggression toward an increasingly provocative opponent. Members of all three dispositional groups initially sought to deliver more intense shocks if they were intoxicated than if they were not. However, only subjects high or medium in premeasured aggression continued to show the potentiating effect of alcohol on aggression as provocation escalated; low disposition subjects did not. This study suggests that alcohol may indeed have differential effects on aggression as a function of individual aggressive dispositions. The potential importance of a finding that alcohol

primarily increases people's latitude or likelihood to do what they are already disposed to do anyway should not be underestimated.

In a related experiment, Pihl et al. (1982) sought to use a self-rating scale of individual differences to predict the post-drinking aggression of subjects, as measured by the level of electric shock they intended to deliver to an alleged partner in what was described as a study of reaction time and pain perception. This study, which included both a controlled alcohol dose and a simple placebo treatment, revealed that subjects who saw themselves as anxious, unhappy, unfriendly, and quick to anger were the most likely to exhibit high levels of aggression, but especially when they consumed alcohol. Again, the significance to the alcohol-aggression link of individual disposition, this time with a more affective flavor, was demonstrated.

Finally, George et al. (1989) investigated the role of trait hostility, sex guilt, and alcohol expectancies of disinhibition, aggression, and sexual arousal in a balanced-placebo study that used unobtrusively measured ad lib viewing of violent and violent-erotic slides as the dependent measure. Results showed that trait hostility significantly predicted time spent viewing the deviant materials in the expect alcohol, but not the expect no alcohol conditions. Similar results were obtained for the expectancy predictors after accounting for variance due to trait hostility. Taken together, the specificity of effect demonstrated in these three studies would appear to undermine any theory of drink-

ing and aggression that does not incorporate individual differences.

Given that the legacy of clinical psychology is an inclination to focus on individual differences, it is remarkable that personal characteristics of subjects have been so neglected where the alcohol-aggression relation is concerned. The diversity of results obtained across subgroups of individuals in expectancy surveys, as well as the tremendous intersubject variability evident in experimental work on alcohol and aggression, should have led us to this point more quickly. Although the relative influence of biology and learning in the development of personality and reactive dispositions remains unclear, such traditionally psychological traits as dominance, emotionality, and impulsivity would appear to be relevant to risk for alcohol-related aggression. Family histories and subtypes of alcoholism and antisocial behavior problems should also be considered, along with correlated differences in psychophysiological and affective responding to aversive and other emotional stimuli (see Lang and Sibrel 1989 for some suggestions of biological and psychosocial individual difference construct that might be profitably integrated into the study of alcohol and aggression). Inclusion of such variables in experimental studies that manipulate drinking and measure aggression could result not only in better prediction of the target behaviors but also in a better understanding of how and why alcohol and aggression are related in certain individuals.

Environmental or Situational Effects

Graham et al. (1980) have suggested that systematic observations in a wide variety of bars and taverns reveal that alcohol-aggression incidents are highly predictable, not on the basis of alcohol consumption per se or individual drinkers, but on the basis of situational factors like crowding, rivalries, and the behavior of others. Pernanen (1991) also has argued that people may drink partly to become more "situationally determined" than is possible when they are sober, although it is unclear how this is compatible with an increased sense of power or dominance. In any event, how does psychological research address such assertions about the importance of situations?

It has already been acknowledged that experimental analog studies often lack ecological validity. Therefore, they might be expected to do a poor job of representing environmental factors pertinent to the alcohol-aggression relation. However, some apparently key situational variables have been explored. Among them are threat or provocation, which can be most easily manipulated using the Taylor reaction-time competition procedure described earlier. Shock levels allegedly selected by the confederate are simply set high or low, depending on the desired manipulation. A number of experiments, starting with Taylor et al. (1976), have shown that threat is at least facilitative, if not essential, to the demonstration of increased subject aggression due to alcohol. Others (e.g., Kelly et al. 1988; Lang et al. 1975) found that provocation had a main effect of increasing aggression, but it

did not interact with drinking. The results are similarly equivocal for frustration, manipulated by offering rewards for successful teaching of the confederate learner (who may or may not be programmed to comply) in the Buss procedure (see Gustafson 1991 for a brief review). Yet, the differential experience of intoxicated persons to threat or frustration or any form of unpleasant stimulation would still seem to be an important area to pursue.

Other situational variables of concern include the limited response options afforded by conventional aggression measurement procedures. Typically, subjects are given no choice about delivery of a noxious stimulus. They can only select its intensity. Obviously, this does not represent most naturalistic situations in which aggression occurs. However, partly to address this problem, Cherek et al. (1985) have developed a procedure with qualitatively different aggressive options (noxious noise delivery or subtraction of points redeemable for money) as well as a nonaggressive response (reinforcement with valuable points). Their work indicates that even when varied response options are available, drinking can still increase aggressive behavior.

It has also been shown that social pressure to increase the aggressiveness of subjects is effective for inebriated but not sober participants (Taylor and Sears 1988). Provision of an explicit nonaggressive norm, on the other hand, curtailed the aggressiveness of intoxicated subjects (Jeavons and Taylor 1985). The prevailing explanation for findings such as these is

that when people are drinking, they become more responsive to salient features of the situation, as I shall elaborate.

Pernanen (1976), Taylor and Leonard (1983), and Zeichner and Pihl (1979) are in essential agreement in theorizing that alcohol's impact on aggressive behavior is partly mediated by its impairment of information processing. Indeed, Steele and Josephs (1990) have built a broader theory of the affective and interpersonal consequences of drinking on an expanded version of this notion. The basic premise is that intoxication limits people's capacity for self-guided thought and perception, leaving them less able to use subtle peripheral cues and to interpret complex, embedded meanings. This means they are more dependent on a limited number of salient cues readily available in the immediate environment. Consequently, when the salient environmental cues are provocative, even if peripheral cues and thoughtful reflection would ordinarily counteract them, the drinker is at elevated risk for aggression. Vulnerability to attention-dividing distraction is also thought to be increased by drinking. This theory is appealing on several counts. Its assumption of cognitive impairment is consistent with the known effects of alcohol on many aspects of human performance. In addition, it allows for greater variability in the behavioral concomitants of drinking as a function of the naturally changing saliency of environmental cues. There is also some research involving the manipulation of cues and meanings that seems to support it.

For instance, Zeichner and Pihl (1979) found that intoxicated subjects

were apparently oblivious to the possibility that the intensity of shocks they received in bogus pain-perception/reaction-time tasks might be contingent upon the intensities they themselves selected for delivery to their partner. Sober subjects minimized the intensity of shocks selected in the contingent condition relative to the noncontingent condition whereas intoxicated subjects did not. Analogous results were obtained in a second study (Zeichner and Pihl 1980) that manipulated information about the confederate's intent (malicious versus neutral) in selecting potentially aversive auditory stimuli used to signal (and provoke) the subject, who subsequently responded by selecting and delivering a shock to the partner. Again, intoxicated subjects did not respond to this relatively subtle cue, whereas sober subjects showed a tendency to be less aggressive when partner intent was characterized as neutral.

The two studies just cited would appear to provide support for the cognitive impairment model of alcohol's effects on aggression. However, when the paradigm of the original Zeichner and Pihl (1979) study was modified to include a condition in which shock contingencies were made salient by having subjects record their pain levels, the theory seemed to unravel (Zeichner et al. 1982). Forced attention subjects were *more* aggressive than either distracted or control subjects; this effect was especially evident in the alcohol condition. Unfortunately, except for another disconfirming study (Gustafson, 1987*b*), little followup work has been done on this theory since the

early 1980's, although investigators frequently invoke its tenets in explaining a wide variety of results. Perhaps the manipulations and measures of information processing have been too crude and indirect to capture the underlying processes adequately, but clearly the intuitively appealing attentional impairment theory of the alcohol-aggression relationship is in need of refinement.

Another intriguing avenue for exploration is the potential mediation of drinking and aggression by alterations in affective response occasioned by intoxication. Concurrent changes in cognition and physiological response might well be involved in such processes. There are certainly indications that the impact of drinking on emotion is multiply determined and, in fact, at least one study (Sher 1985) has demonstrated that agent, host, and environment exert both independent and interactive effects on subjective state. This opens up a number of possibilities. Perhaps an effort should be made to determine how alcohol affects anger and fear. It could be, for example, that drinking increases vulnerability to anger and/or reduces fear of consequences and that is why alcohol is associated with greater aggression. There are already some psychophysiological data on responses to aversive and other emotion-laden stimuli that suggest marked individual differences of potential relevance to the alcohol-aggression connection (e.g., Finn and Pihl 1987; Patrick et al., 1993). Recent intensification of the trend toward subtyping of both alcoholics and psychopaths according to their childhood

history of conduct disorder and related biological substrates (e.g., Cloninger 1987; Hare and Cox 1978) also suggests possible links between alcohol and aggression that need further exploration.

SUMMARY AND CONCLUSION

The available experimental evidence seems to have provided a firm empirical basis for the proposition that drinking can *cause* increases in aggressive behavior, at least in certain doses, in certain persons, and under certain circumstances. In many ways, however, this is really all we know. It is not clear which of the many potentially important aspects of the agent, the host, and the environment are critical to the interaction that produces increased aggression. Further exploration of individual differences in emotional responding and in psychophysiological reactions to alcohol appears to me to be especially promising, but the possibilities for research seem limitless. Certainly, gender differences and the distinction between general aggression and sexual aggression need more attention. There has also been a reluctance on the part of experimental researchers to tackle situational/environmental variables and to include aspects of alcohol, person, and situation *in the same design*. All these possibilities are exciting.

There is something very troubling, however, about the current state of affairs. For most of the last decade there has been a conspicuous lack of any viable theory or theories capable of organizing and explaining the results of the many experiments that have been conducted and/or of serving as the basis for programs of new

ones. Perhaps recognition of the fact that a single theory need not account for all alcohol-related aggression would be a step in the right direction. Well-crafted sub-theories for particular doses of alcohol, special populations, or unique contexts could be very valuable. Development of more varied and creative laboratory measures that capture more of the sequential process through which drinking might lead to aggression would also be a worthy goal. Of course, it is only my opinion, but I think experimental psychologists and other closely aligned investigators have become too paradigm bound, cranking out new facts by tweaking a variable here and there, but never really getting anywhere. I hope that this monograph will help change that.

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Alcohol and Aggression: Three Potential Mechanisms of the Drug Effect

R.O. Pihl and J. Peterson¹

The alcohol-aggression relationship is multifactorial and interactive. Indeed, given the results from numerous expectancy studies completed by and alluded to by Lang (this volume), alcohol per se does not even need to be a necessary condition. Just the belief that one has consumed alcohol can sometimes suffice. Factors operating at the level of the person and the environment/culture each affect the response to the drug and in turn are altered by the resultant feedback. Thus, the two current approaches to explaining drug-related violence of either focusing on the characteristics of the person consuming the drug or what the drug is doing to the individual are both valid.

Unfortunately, the involvement of myriad factors has led to the large degree of variability within and between studies, which, as Lang pointed out, appears to be an endemic problem. In order to begin to grasp the sources of confusion, attention needs to be directed at delineating more specifically the role of the factors that comprise the interaction. Given a

solid foundation, perhaps then pieces of the puzzle will begin to fit with greater predictability.

This brief paper is designed to focus explicitly on the question of how alcohol may directly affect psychological mechanisms that would increase the likelihood of aggressive behavior. Three specific mechanisms that we have recently explored in detail elsewhere (Pihl and Peterson 1993; Peterson and Pihl 1990) will be discussed and results of laboratory alcohol/aggression studies presented in their support. These mechanisms are an increase in pain sensitivity in normal individuals, a decrease in the use of cues regarding one's own behavior, and a decrease in frontal lobe functioning and a concomitant loss of alternative problem-solving strategies. Figure 1 presents a schematic of these three mechanisms and their putative effect in relationship to potentially increased aggression.

Laboratory studies of the alcohol-aggression relationship provide the advantages of control, precision, and the ability

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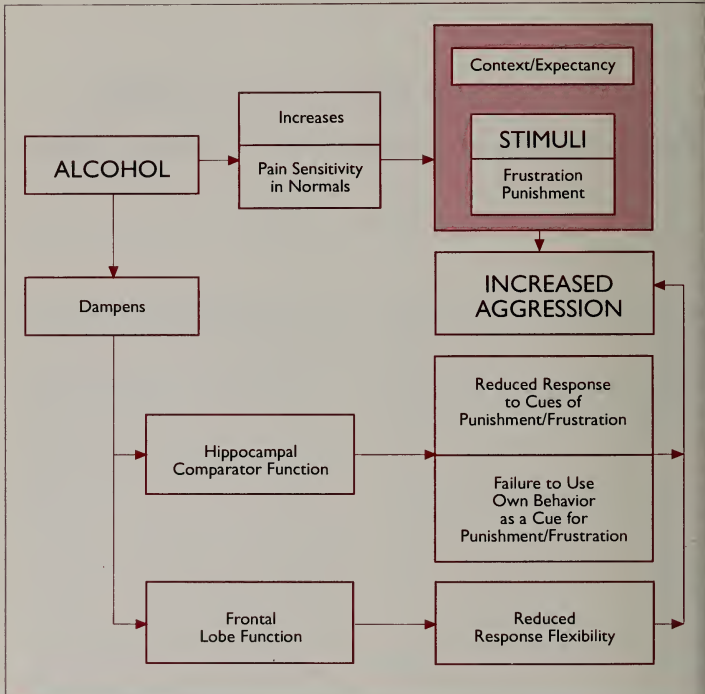


FIGURE 1

A theoretical model of the effect of alcohol on mechanisms that increase the likelihood of aggressive behavior.

to specify variables, circumstances usually absent in nonlaboratory situations. However, the disadvantages of such studies include the range of limitations referred to by Lang (this volume) and, in particular, the use of often arguable measures of aggression and the manipulation of variables conservatively labeled "artificial." The aggression measures utilized in the

studies described below were the intensity and duration of an electric shock that one subject administered to another presumed subject (actually a computer) in a reaction time competitive task. This procedure, labeled the Buss-Taylor Task, has had a number of modifications, the majority of which involve use of a provocative aversive stimulus being delivered to the subject by

the "partner" when a trial is lost. Aggression scores obtained with this procedure have been shown to be both reliable and valid (Bernstein et al. 1987) and are related to aggression rated by peer (Williams et al. 1967) and by self (Shembert et al. 1968) as well as to a history of antisocial behavior (Hartman 1969). The procedure is also the "method of choice" in alcohol and aggression studies, which have demonstrated an expectancy effect, an alcohol effect, variability relative to type of alcohol consumed, and dose, provocation, and attributional effects (for reviews, see Taylor 1983; Pihl 1983; Pihl and Ross 1987; Lang and Sibrel 1989; Bushman and Cooper 1990).

PAIN SENSITIVITY

Pain, broadly defined to include frustration and the absence of expected rewards, is easily the most apparent eliciting stimulus for aggression. This literature is voluminous and consistent and is really only criticized because it does not account for the totality of aggressive behavior. Thus if alcohol was in some way to increase sensitivity to pain, a persuasive explanatory factor would be evident. Unfortunately, alcohol consumption linked with increased pain sensitivity seems counter-intuitive. "Feeling no pain" when intoxicated is part of the popular vernacular, an idea that seems to mix much better than alcohol and aggression. Indeed, alcohol has been used as an anaesthetic (Mullin and Luckhardt 1934; Wolff et al. 1942).

However, as mentioned previously, alcohol effects are not ubiquitous. Rather, they are related to dose, rate of adminis-

tration, time passed since consumption, subject characteristics, previous drinking history, and undoubtedly other factors. Thus a drug which has analgesic properties at high dosages may in some individuals have quite the reverse properties at lower dosages. Grey (1982) has reported in a series of studies with rats an increased sensitivity to pain while alcohol intoxicated. Specifically, these animals showed reduced flinch and jump thresholds to electric shocks. Gustafson (1986) has further noted increased subjective ratings by humans of sensitivity to electric shocks, when given alcohol over a placebo.

In our research with individuals from multigenerational alcoholic families, we have failed to demonstrate increased pain sensitivity when intoxicated and, in fact, have shown just the opposite in this narrowly defined population (Stewart et al., submitted). These latter results are consistent with the literature showing that alcoholics in general are more sensitive to pain stimulation than controls when sober and more sensitive to the pain-reducing effects of alcohol than others (Brown and Cutter 1977). In effect, alcohol seems to normalize a sober overreactivity to pain in this population. Interestingly, these at risk for alcoholism individuals appear to be less aggressive when intoxicated on the Buss-Taylor Task than controls who are not at risk (Pihl et al. 1990).

REDUCED CUES TO PUNISHMENT AND FRUSTRATION

Disinhibitory theories of intoxicated aggression are perhaps the most promi-

ment (Graham 1980; Bushman and Cooper 1990). Often these theories are expressed in informational terms (Hull 1981; Pihl et al. 1981; Steele and Josephs 1988). There is even a commonality, albeit strained, with psychoanalytic theorizing regarding reduction in superego control. Grey (1982, 1987) has written two books that explore what he calls the behavioral inhibition system, which in response to threat halts ongoing activity and initiates sensory motor cognitive activity directed toward analysis and response to specific, threatening cues. This system is presumed to comprise a neurological circuit involving the septum and hippocampus and their interconnections with other limbic and cortical structures. Grey presents an array of experimental literature to demonstrate that anxiolytics, including alcohol, seem to operate differentially on the behavioral inhibition system. While these drugs may actually enhance response to punishment and frustration, they are seen as reducing associated cues related to fear and anxiety. This effect is probably explanatory for alcohol-affected stress-response dampening seen in sons of multigenerational male alcoholics (Pihl et al. 1990) and in the reduction of anxiety following drinking in anxiety-sensitive women (Stewart et al., in press).

One aspect of human socialization is the process of teaching children to regard aspects of their own behavior as a threat to their own well-being and to that of others. Individuals who do not learn this connection threaten the integrity of the social group. Thus, well-socialized indi-

viduals engage in aggressive acts only in extremely limited situations. To engage in aggression outside of this narrow range of justifiable situations in itself should be a cue for punishment and frustration. As alcohol disinhibits all behaviors under the general inhibitory control of fear, of which cues of one's own aggression is primary, intoxicated individuals should participate in dangerous situations where this behavior would normally be inhibited by threat of danger.

Three studies we have completed present some support for this theory. Each of these studies used a modified version of the Buss-Taylor Aggression Task. Unlike the majority of studies using the paradigm in which subjects receive and give electric shocks, the first three studies described below involve subjects receiving aversive tones but delivering shocks. In the first experiment (Zeichner and Pihl 1979), 72 male social drinkers between the ages of 18 and 35 were divided into six groups. There were three drug conditions and two contingency conditions. The drug conditions were alcohol, placebo, and sober; individuals participated in the aggression task after receiving 1.32 mL/kg of 95-percent USP alcohol or placebo or nothing and were randomly assigned to one of two contingency conditions. In the first condition, the intensity of the aversive tones the subject received was correlated with the shocks they delivered; in the second condition, the tones they received were unrelated to their own behavior. Figure 2 illustrates significant differences in the no-alcohol and placebo conditions between individuals who received correlated versus

uncorrelated consequences. This result confirms the well-known conclusion in the aggression literature that the behavior we emit is related to the behavior we receive. Disconfirming this well-known fact, there was no difference in correlated and uncorrelated responding when intoxicated (average blood alcohol level 0.092), with subjects failing to modify their behavior as a result of the consequences. Because it appeared subjects were not processing information relevant to the conse-

quences of their own behavior, a second study was designed as follows.

This study (Zeichner et al. 1982), the results of which are depicted in figure 3, attempted to require subjects, whether intoxicated or not, to attend to the consequences of their own behavior. In this study there were two drug conditions: subjects received either 1.32 mL/kg of 95-percent USP alcohol or placebo. In the first of the three behavioral conditions, the intention was to have subjects actually pay less

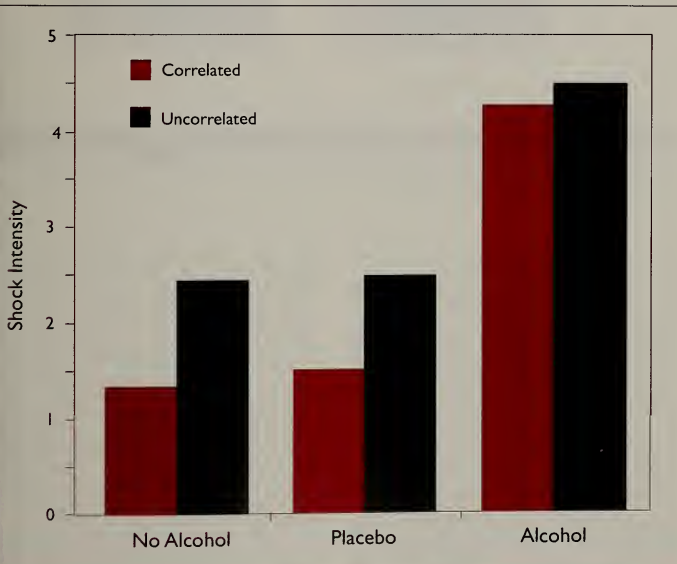


FIGURE 2

Shock intensity delivered by males who consumed no alcohol, placebo, or alcohol, when shock reception was correlated or uncorrelated with shock administered.

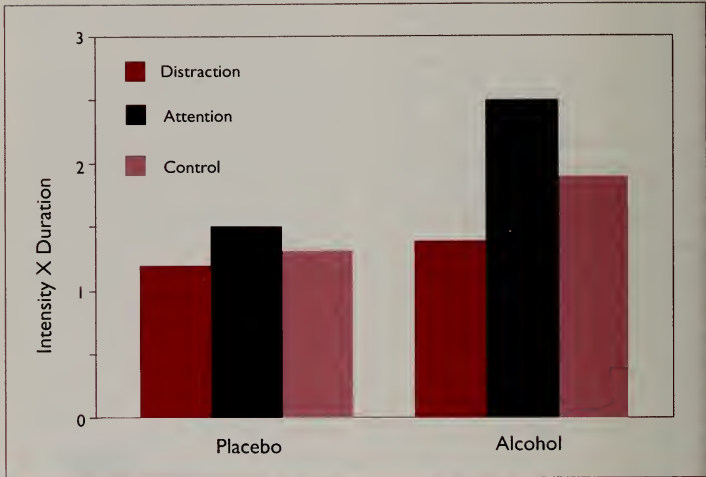


FIGURE 3

Shock intensity \times duration delivered by males who consumed a placebo or alcohol, during forced distraction, forced attention, and while attending normally.

attention to the consequences of their behavior by having them complete a mathematical problem concurrent with participation in the competition task. This was labeled the distraction condition. In the second experimental condition, subjects were required to focus specifically on the consequences of their own behavior as well as the behavior of their competitor. They were required to write down the level of the shock that they administered and the level of the tone they received. The third control condition involved the correlated alcohol condition of the previous study. Figure 3 illustrates that distraction resulted in a significant reduction in alcohol-related

aggression, and that individuals forced to attend to the consequences of their own behavior when intoxicated were the most aggressive. From these results one could conclude that awareness of behavior and its consequences may not be as important as presumed. Rather, the affective component of this knowledge appears no longer to be accompanied by fear. The results suggest information is being processed, at least verbally, but no longer inhibits behavior.

A third study (Zeichner and Pihl 1980) also supports the position that threat is affected by alcohol. This study employed three drug groups: alcohol 1.32 mL/kg, placebo, and control. Subjects

were randomly assigned to one of two intent conditions. In an intent condition called neutral intent, subjects were told that the aversive stimuli they were receiving from their competitor was actually fixed according to a predetermined schedule developed by the experimenter. In the malicious condition subjects were told that the aversive stimuli they were receiving was chosen by their competitor. Actual aversive stimulation was identical in both groups. The results were quite similar to those presented in figure 2 (the contingency study). That is, control or placebo subjects' aggressive behavior was restricted by considerations of intent, with malicious intent evoking significantly more aggression than neutral intent. Again, as with the consequences study, intoxication obviated this relationship. The notion of intent is basic to our conceptualizations of justice; to aggress against another without consideration of intent suggests a breakdown in socially defined norms, which in turn we would argue are threat based. Inhibition of aggression involved in the threat of breaking the social rule now seems to have been eliminated by intoxication.

Decreased Frontal Lobe Functioning

Figure 4 presents the results of a recent study we completed (Peterson et al. 1990) in which a battery of neuropsychological tests was administered to individuals who had been randomly assigned to one of three doses of alcohol (placebo, 0.66 mL/kg and 1.32 mL/kg of 95-percent USP alcohol) within a balanced placebo design. In this procedure half the subjects were

told that they were receiving alcohol while the other half were told they were receiving placebo. Thus, drug and expectancy are putatively crossed. Alcohol expectancy effects were found for only 2 of the 20 tests—digit span and the Young-Pihl Memory Test. Furthermore, under the dosages studied, alcohol seemed to have little effect on intellectual functioning as measured by standard IQ tests. What alcohol did seem to affect was performance on tasks associated with delayed memory and cognitive ability often associated with the functioning of the prefrontal cortex. Significantly and specifically affected, notably by the higher intoxicating dose, were such tasks as assessment, planning and foresight, organization of behavior, abstract conceptualization, memory transfer of information, and tasks involving complex motor behavior. We concluded from these results that alcohol did not seem to affect previously learned knowledge but rather the ability to deal with the threatening or novel. It has been suggested (Luria 1980; Peterson and Pihl 1990) that the prefrontal cortex is critical in the formulation of verbal and motor strategies aimed at dealing specifically with issues of threat or novelty. In a very recent study (Lau et al. 1992), frontal lobe functioning was crossed with alcohol, and provocation and aggressive behavior were assessed. In this study 114 male social drinkers were administered two tests developed at the Montreal Neurological Institute, and putative of frontal lobe functioning, the spatial conditional associative learning task (Petrides 1985), and the self-ordered pointing task

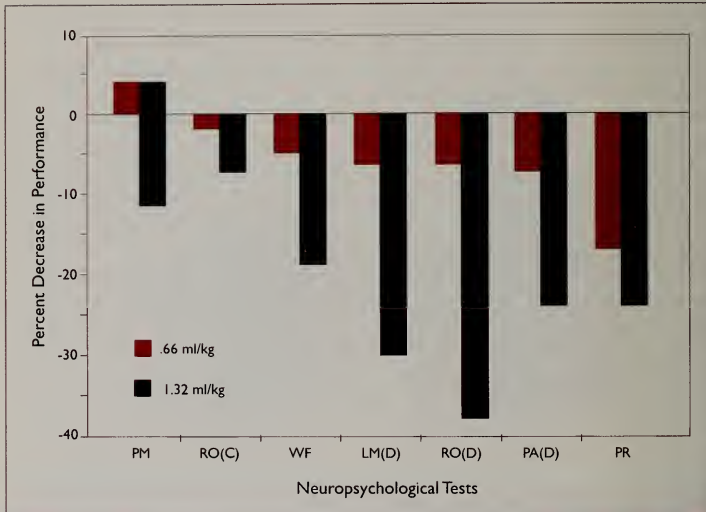


FIGURE 4

The percent decrease in performance for subjects given two dosages of alcohol from the norm of sober controls on a battery of neuropsychological tests. PM=Porteus Maze; RO(C)=Ray Osterreith copy; WF=Word Fluency; LM(D)=Logical Memory Delayed; RO(D)= Ray Osterreith delayed; PA(D)=Paired Associates Difficult; PR=Pursuit Rotor.

(Petrides and Milner 1982). Subjects were categorized by their performance on these tests; those in the upper and lower quartiles were selected for participation on the aggression task. Half of these subjects engaged in the task while sober and the other half after consuming 1 mL/kg of 95-percent USP alcohol. The aggression task itself was presented in two phases. For the first 13 trials, subjects received shocks in the lower half of their previously determined shock threshold, and in the second 13 trials, subjects received shocks in the upper half of their threshold. These con-

ditions were viewed respectively as low provocation and high provocation. All shocks were randomly assigned by the computer and were of the same duration. Each subject won and lost exactly half of the trials during both provocation conditions. The results of this study were a significant drug effect, group effect, provocation effect, and provocation by group interaction. Conclusions of seeming importance include that individuals who score low on two putative tests of frontal lobe functioning are more aggressive when sober than those with intact

functioning when provoked. This perhaps suggests a fundamental impairment in integrating inhibitory responses. In addition, the effect of an intoxicating dose of alcohol is to render those individuals who reflect intact functioning when sober as aggressive as their lower functioning comparison group. These results support the notion of an alcohol effect on frontal lobe functioning and a resultant increased likelihood of aggressive responding when sufficient provocation is present.

SUMMARY

Increased pain sensitivity, reduced response to cues of punishment, and reduced response flexibility are alcohol-related effects that can increase the likelihood of aggressive responding. While individual factors as well as situational factors are crucial considerations in the aggression equation, the effects of alcohol should not be overlooked. For example, a particularly perplexing finding is the high percentage of victims of violence who also have been found to be intoxicated. In a recent review of 26 crime studies from 11 countries, 45 percent of victims were found to have been drinking (Murdoch et al. 1990). The three effects described above are just as applicable in explaining both this fact as well as the fact that 62 percent of the violent offenders were drinking, typically heavily.

Finally, it should be noted that there are clearly other drug effects, some of which are individualized (e.g., pathological intoxication and/or hypoglycemia), which undoubtedly also affect the alcohol/aggression relationship. Nevertheless,

to paraphrase Swift, "drinking is not just a mere pause from thinking but a respite from feeling too."

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Set and Setting Revisited: Influences of Alcohol and Illicit Drugs on the Social Context of Violent Events

Jeffrey Fagan¹

INTRODUCTION

Among the many explanations of violence and aggression, few have been more enduring than the pharmacological effects of alcohol intoxication. The acute effects of alcohol use have been associated with assaultive and sex-related crimes, serious youth crime, family violence toward both spouses and children, being both a homicide victim and perpetrator, and persistent aggression as an adult. Some studies have shown that disruptions in the alcohol supply have resulted in temporary reductions in violence (Olsson and Wikstrom 1982; Room 1983). In fact, the many relationships between alcohol and violence have been integral parts of American folklore, from the "barroom brawl" to the chaos of Prohibition to the many portray-

als in the popular media of violence following drinking.

Yet the link between intoxication and aggression is less certain conceptually than is implied by the scientific literature and popular opinion. Despite persistent empirical evidence that alcohol use and aggression are related, empirical research shows that intoxication does not consistently lead to aggressive behavior.^{2,3} Instead, research on the alcohol-violence relationship has consistently found a complex relationship, mediated by personality and expectancy factors, situational factors, and sociocultural factors that channel the arousal effects of ethanol into behavior types which may or may not involve interpersonal aggression (Pernanen 1991).

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²In common lore, the "maudlin," "amorous," and "gregarious" drunks all typify behaviors that were not manifest before, but that emerge following, alcohol intoxication (Mayfield 1983).

³There have been numerous reviews of the alcohol-violence relationship. Collins (1991) summarized their findings by noting that (1) most drinking occasions are not followed by violence; (2) violent problem drinkers act violent only occasionally and far less often than the frequency of their drinking events; (3) most research in this area is seriously confounded by methodological problems, especially the use of convenience samples and measurement of drinking behavior; and (4) the mechanisms by which drinking precipitates violence are poorly understood (p. 654). Collins also noted that while there is empirical evidence of an association between the acute effects of alcohol and violence, there is no evidence of the effects of chronic alcohol use and violence.

Consider the simple proposition that the same individuals, drinking in similar patterns (amounts, alcohol content, etc.), will behave quite differently in different social settings or contexts. This raises two simple and related questions: (1) To what extent and precisely *how* does the drinking setting channel the arousal effects of alcohol into varying behavioral patterns? and (2) To what extent and how does alcohol mediate the arousal effects of specific drinking contexts into varying behavior patterns?

Two alternative views guide the responses to these questions. Social context mediates the violence outcomes of human interactions through normative processes that enforce the ethics of social interaction which regulate everyday social life (Doyle and Luckenbill 1991). Despite broad recognition of the importance of sociocultural processes in mediating alcohol and violence (see Heath 1988 for example), there is little agreement on conceptual frameworks to specify the ways that social norms and contexts influence the outcomes of drinking episodes. While culture, setting, and expectancy may shape behavioral responses to alcohol, the origins of the expectancy and social controls regarding drinking are less well understood.

An alternative view involves *human guidedness* to explain the occurrence of violence during drinking. Pernanen (1991, p. 18) suggests that some drinking behavior is socially functional and is instrumental in achieving socially permitted or desired behaviors. This framework deemphasizes the specific effects of alco-

hol and focuses on interactions between individuals in particular settings leading to expected or desired behavioral outcomes. The phenomenal effects of alcohol itself are secondary for this interpretation, almost to the "vanishing point" (Pernanen 1991, p. 211). Both of these views have received considerable theoretical and empirical attention.

The specific effects of alcohol itself also influence the social processes and sociocultural influences on alcohol-related violence (Fagan 1990a). The physiological effects of alcohol on cognition and social perceptions is evident in field studies such as Burns (1980), Vigil (1988), and other ethnographic accounts of alcohol and violence, as well as in experimental research in laboratory settings. The ethnographic studies also tell us that alcohol is the substance most often selected to achieve certain functional-instrumental or expressive ends. Alcohol has specific influences on group dynamics, and its effects are an important part of the social ecology of drinking and violence.

Thus, the social context that influences alcohol-related violence includes lore about alcohol itself, especially knowledge of its effects, and the effective communication of this lore within social groups. What appear to be situationally or culturally determined behaviors may in fact reflect decisions to place oneself in a context where drinking will provide opportunities to become violent (or amorous or gregarious). How these scenes come to develop these labels becomes an important part of the dynamics of what is lumped together in the terms "context" and "social process."

This chapter examines the dimensions of social context and discusses frameworks to explain its influence on the relationship between alcohol and violence. Processes associated with social context involve factors that are influential at broad macrosocial levels as well as within microsocial interactions. Accordingly, this chapter examines the factors within cultures that shape beliefs about the effects of alcohol on violence, the social controls that permit or sanction behaviors while intoxicated, and the enforcement of those rules across diverse circumstances.

The chapter begins with a brief review of frameworks that specify contextual influences on relationships. Evidence from the literatures on both alcohol and illicit drugs are reviewed. The chapter next examines four illustrations of social "contexts" in which alcohol-violence relationships have been well studied. The chapter concludes with some unifying themes that may be included in a framework for understanding the effects of alcohol on violence and the dynamics of what we broadly label as social context.

CONCEPTUALIZING SOCIAL CONTEXTS

The influence of social context has been examined in the study of both interpersonal violence and intoxication. Zinberg's (1984) *holy trinity* of drug, set, and setting examined the social processes regulating drug consumption patterns, group membership and behaviors following intoxication. The controlled heroin users in his sample actively constructed and maintained the rituals and norms that guided

both behaviors within the group and group membership itself. Sampson and Lauritsen (forthcoming) identified the mediating processes within social contexts that shape the interactions between individuals and communities leading to interpersonal violence. These and other recent conceptual views of social context distinguish between the social functionality of behaviors (either their instrumental or regulative functions) and the social processes that we may falsely view as the "determining" influences of setting.

Despite recognition of the importance of social contexts on alcohol-related violence, the definition and components of the social processes within these contexts have been only vaguely specified. The research on *setting* or *context* as a mediating construct has been largely descriptive and conceptually underdeveloped. These terms may refer to spatial or physical dimensions, social aggregations or structural features of a group, or specific situations. Social context may be interpreted as an external condition and at other times as a dynamic process intrinsic to a specific social milieu. It may refer to cultural norms or to microsocial interactions. Thus, while all may nod their heads at claims that drinking is a "socially embedded" behavior, we are not quite sure exactly what it is embedded in.

Specific conceptualizations of social context vary extensively, and each has some support in the empirical literatures on aggression and drug use. Social context may be defined in terms of its structural features. *Composition effects* refer to population heterogeneity in a specific milieu.

This may include the number and types of people, their socioeconomic status, and the gender, age, and race makeup of a group that populates a locale (Stark 1987). *Spatial effects* include the neighborhoods where drinking locations are situated (Roncek and Maier 1991) and their proximities to other social domains where crimes may be prevalent (Cohen and Felson 1979). The *physical environment* also may influence the behaviors in a location: Lighting, crowding, and decor are prominent in the barroom literature as influencing the patterns of social interaction and the prospects for violence (see Cavan 1966; Boyatzis 1983).

Other constructions of social context emphasize the normative patterns of belief about both alcohol and violence that are attached to the setting itself. The meaning and purpose of alcohol use in a setting, together with the beliefs about permitted behaviors in the setting, comprise the expectancies about alcohol and violence specific to a location. Thus, *human guidedness* (Pernanen 1991) may lead individuals to seek out settings they believe will sanction or tolerate the behaviors they anticipate in a particular drinking event. The presence of controlling cultural rituals also proscribes the behaviors that are permitted in drinking events (see, for reviews, Levinson 1983*a,b*).

Conceptualizations of social context often are confounded with the presence and salience of both formal and informal social controls in a particular location. Social control comprises a range of constructs, from internalized restraints (for example, the social "costs" of violence, or one's stakes in conforming to a social

order), to the informal social rules and regulatory processes that characterize groups and situations, to the formal rules attached to specific locations. Violence itself has been defined as a process of social control (Black 1983; Katz 1988; Fagan 1992), used to settle grievances or maintain power relationships. The social cohesion among individuals in a setting influences the strength of these regulatory processes. Zinberg (1984) explained how groups develop and enforce social sanctions, especially social "punishments" (such as exclusion), that may be particularly salient for would-be violators of the "myriad rules" of the group and situation.

The importance of the collective personality of the group, or what Zinberg (1984) called "set," lies in its ability to enforce these codes and modify behaviors using social sanctions. If a group is normatively oriented toward violence, drinking episodes may be shaped in that direction (see for example Buford 1991). Skog (1991) suggested a social network approach to understanding the regulatory functions of groups on alcohol-related behaviors, noting that individual drinkers tend to model and modify each other's drinking behavior. But the regulatory effects of a social network vary according to the embedment of individuals within the group. Heavy drinkers may be restrained from problematic behaviors if well integrated in a "dry" group, but only weakly affected if marginally immersed in that network. Drinkers who are poorly integrated into any social network may evidence anomic tendencies, increasing the risk for either self-injury or interpersonal

violence (Durkheim 1966). While bars and taverns may offer some form of social integration to their patrons, the occurrence of violence may reflect the interdependence of the attributes of the bars with the violence proclivities of the patrons. Skog (1991) also noted that drinking may weaken informal social control in two ways: It alters the social cohesion of a group and may compromise the attachment of individuals to each other and the group.

Accordingly, social contexts are both mediating structures and processes that channel the arousal effects of alcohol. It also seems that alcohol can mediate the controlling functions of the social context by detaching the ties of an individual to the group and reducing the salience of the social sanctions of the group for violations of its norms or rules. Consideration of the effects of *context* or *setting* should carefully deconstruct these terms to assess the influences of each component, particularly the regulatory processes that set and enforce behavioral boundaries. We may thus conceptualize social context as a complex web of social controls from multiple sources: external and structural factors, intrinsic attributes of social groups and their aggregate personalities, and the social interactions that occur within groups and between groups and settings. The mechanisms by which these processes and structures influence the occurrence of violence during drinking are examined in the following sections.

INTOXICATION, VIOLENCE, AND SOCIAL CONTEXTS

Situational Factors

Substance use and behavioral norms vary both by culture and the specific social set-

ting within the culture. For example, there is a cultural tendency to ascribe blame to alcohol for most of the negative behaviors that occur following its consumption. This "malevolence assumption" (Hamilton and Collins 1981) suggests a moral status of alcohol. The same has developed over time regarding most illicit drugs (Musto 1981), despite empirical evidence that their ill effects are not felt by the majority of users. There can be little doubt that these attributes of most substances influence their cultural phenomenology, and in turn, expectancies of their effects on behaviors. However, analyses of expectancy (e.g., Critchlow 1986) suggest that beliefs about expected behavioral effects of substances vary according to the social situations in which intoxication occurs.

Social situational factors are attributes of an immediate setting that directly or indirectly influences the behavior of intoxicated people in that setting. Both Levinson (1983*a,b*) and Burns (1980) cited three situational factors that influence the social processes of a setting: The number of people present, the nature of their relationships (intimate, familial, adversarial), and the permissiveness of the situation. Interpersonal violence seems to occur in some situations more than others, and even in different venues of the same type of setting. For example, there is more violence in some bars than others, though there also is more violence in bars than in other social contexts in which alcohol is used. Aggression occurs in some sports stadiums and more often during some types of sporting events than others. The

absence of informal social controls, external restraints, or perceptions of societal disapproval may contribute to interpersonal aggression between intimates following intoxication (Straus 1977-1978).

Permissiveness describes the social controls of the setting that sanction or accept behaviors. The origins of these norms or permitted behaviors is uncertain, but some research suggests how controls against aggression during drug or alcohol use are maintained. For example, the peer processes within the groups described by Reinerman (1979) for cocaine and Zinberg (1984) for heroin suggest a strict social setting that does not tolerate behaviors not approved by the group's norms. Among adolescents, the use of certain intoxicants (e.g., PCP or alcohol) that produce exaggerated, boisterous behaviors can result in ostracism from a cohesive social group (Feldman et al. 1985).

Roman (1981) defined a "situational ecology" that either constrains or permits specific behaviors. An ecology of aggression might include the nature of the relationships among those in the setting, and the type of environment (private home, tavern, open space, public event). Steadman (1982) suggested that we study "violence prone situations," defined as the interaction between specific types of people and situations.⁴ Levinson (1983*b*), Roman (1981), and Steadman (1982) included in this ecology factors that exist at different levels and may interact to pro-

duce aggression: social setting at the small group or situational level, and cultural processes at the societal or subcultural level. In this ecology, aggression following alcohol or drug use may convey several meanings or purposes: interpersonal or intergroup conflict, ritual or social adjunct, or expression of power and control. Understanding the dimensions of an ecology of behavior during intoxication may contribute to explanations of the social sources of interpersonal violence during drug or alcohol use.

Deviance Disavowal

Beliefs about the effects of specific substances have fostered the "excuse function" of substances and "relaxed standards of accountability" under the influence of substances (Collins 1988*b*). Similar patterns are noted within subcultures regarding other substances, although within the United States, the meanings and norms of substance use differ widely across adolescent subcultures (Beschner and Friedman 1986). Heath (1978) suggested that there are special beliefs in nearly all cultures regarding alcohol, but the rules for drunken comportment are contradictory across cultures. It is likely then that the "excuse" function of intoxicants also largely has cultural determinants.

This notion of the disavowal of deviance essentially relocates blame for behavior from the individual to the substance. Reinerman and Critchlow-Leigh (1987) suggested that this not only serves

⁴Steadman found that violence in interpersonal disputes was greatest when the dispute was outside the home, late at night, when alcohol or drugs were used by either party involved, in the presence of third parties, where strangers were involved, and where one party was physically dominant over the other.

to excuse misbehavior while intoxicated, but it also reassures others that the behaviors themselves do not challenge the legitimacy of the violated norms. Thus, wife beaters do not challenge the sanctity of marriage nor the societal laws against assault. Rationalization or externalization of blame has been used to explain other forms of deviance and criminality. Sykes and Matza (1957) suggested that the denial of responsibility was one of several "techniques of neutralization" that individuals use to justify criminal behavior. Disavowal also permits behaviors that violate nonlegal social taboos, especially sexual behaviors or revelry (MacAndrew and Edgerton 1969; Reinerman and Critchlow-Leigh 1987).

The plausibility of the disavowal framework depends on the acceptance of these accounts of behavior by society. Such accounts help avoid the assignment of an identity to an individual consistent with their deviant behavior (e.g., Scott and Lyman, 1968).⁵ Collins (1983) suggested that there is a synergistic relationship between cultural acceptance of such accounts and the relocation of blame to substances that are widely thought to "cause" or at least excuse such behaviors. When cultural evaluations accept that substances cause aggressive or illegal behavior, then these accounts are more

often honored by society, and the use of such excuses also is greater. However, acceptance of "excuses" is mutable and vulnerable to historical and cultural shifts in societal attitudes about substances (see: Silver 1979 regarding marijuana; Reinerman 1979 regarding cocaine; Musto 1981 regarding opiates; Reinerman 1988 regarding Mothers Against Drunk Driving and the modern temperance movements).

Social Regulation of Drinking, Drug Use and Behavior

Collins (1988b) suggested that expectancy also has cultural roots; beliefs and expectations about the psychopharmacological effects of a substance help shape the rules governing its use and the behavioral effects anticipated after drinking. Understanding controlled drug use tells us much about the cultural and social factors that shape expectancy toward aggressive or nonaggressive behaviors. In turn, these may influence changes in cognitive, affective, or emotional states following intoxication.

Zinberg's (1984) study of controlled opiate users⁶ identified four rituals and social sanctions that promote controlled use within subcultures of drug users: (1) rules and boundaries that defined moderate and compulsive use; (2) norms that limited use to physical and social settings that were conducive to positive or "safe"

⁵Legitimate accounts, for example, are those that rely upon widely shared underlying assumptions and that are understood by the situationally relevant group as applying to it.

⁶Controlled use was defined as consistent drug use without experiencing the potential harms of each substance. Multiple and daily use were excluded as frequency categories. The initial frequency criterion for subject selection was one use per week or less for at least 1 year prior to interview. Subjects had first used an opiate at least 2 years ago, and in the past 2 years have had as many days of abstinence as use. Moreover, they were required to have not used any substance in an uncontrolled way, using the same criterion of abstinence days.

drug experiences; (3) explicit recognition of potentially harmful or unpleasant drug effects; and (4) rituals that supported users' nondrug-related relationships and obligations (e.g., family, work, money). These rituals developed within social networks of drug users and were communicated primarily through peer group processes (Zinberg 1984). Others have noted similar group processes within independent networks of drug users (Reinarman 1979; Schwendinger and Schwendinger 1985; White et al. 1987). The social learning basis for these peer group processes is evident in the description by Zinberg (1984):

Without doubt the most important source of precepts and practices for control is the peer using group. Virtually all of our subjects had been assisted by other non-compulsive users in constructing appropriate rituals and sanctions out of the folklore of and practices circulating in their drug-using subculture. The peer group provided instruction in and reinforced proper use; and despite the popular image of peer pressure as a corrupting force pushing weak individuals toward drug misuse, our interviews showed that many segments of the drug subculture have taken a firm stand against drug abuse. (p. 18)

The cultural phenomenology of different substances apparently has varying interpretations not only in different cul-

tures (Heath 1983), but also for specific social groups within cultures. Explanations of the effects of intoxication on aggression must account for the development, maintenance, and expression of such normative processes within social groups regarding the uses of substances and the permitted behaviors following their use. Such cultural processes themselves are mutable. Not only does the cultural phenomenology of a substance and the immediate social network of the user influence expectancy, but the norms within these networks may develop and change in response to social and economic influences on the users' social milieu.

Hamid (1990) studied the evolution of drug use and drug selling over a 10-year period in several New York City neighborhoods with high concentrations of Caribbean immigrants. In these neighborhoods, substance users and dealers are primarily types of working populations. They earn income on an hourly basis, through a combination of legal and illegal work. The social organization of people in these drug markets is closely tied to the economic fortunes of their neighbors, and their social networks change in response to social and economic developments in the surrounding communities. As neighborhoods changed in their commercial and social makeup, so too did patterns of substance use and the social controls on aggression that define behaviors (following intoxication) that are permitted. Moreover, changes in the arousal effects of the drugs themselves (from marijuana and alcohol in the 1960's and 1970's, to opiates in the 1970's, and then

to cocaine and crack in the 1980's) combined with profound economic changes to weaken social controls of intoxication-aggression patterns among the residents. His ethnographic research found that the forms of social organization and social rituals of drug use were established, then dismantled and reconstituted in novel ways when use of one substance was succeeded by another. As new networks of distribution developed, so too did new forms of social control.⁷

VIOLENCE AND SUBSTANCE USE IN SPECIFIC SOCIAL CONTEXTS

Research on social processes and causes of the alcohol intoxication-aggression relationship often has focused on the controlling aspects of specific social contexts. But these contexts also may provide a motivational influence on the occurrence of violence during drinking. Unless one is willing to assume that behaviors are intrinsic and vary only according to one's social or individual restraints, *motivation* is necessary to explain deviant behaviors. The evidence of social cues that influence behavior while drinking has been well documented (see Fagan 1990a), and the distortion of alcohol on cognition is implicated in the onset of aggression following drinking (Collins 1991).

Motivation, or provocation, may be intrinsic to situations. Bernard (1990)

suggested that there are numerous sources of situational provocation in everyday life: annoyances, conflicts, fears, minor sensory assaults, and grievances that result from interpersonal interactions or interactions with institutions. Alcohol can mediate the arousal effects of these interactions in several ways. Cognitive impairment may lead to misinterpretation of benign cues as threatening gestures or statements. Intensified emotional states may elevate rage states or induce fear, leading to defensive aggression. Drinking may alter the attachment of an individual to his controlling social group, change perceptions of the salience or weight of social controls, or mitigate the effectiveness of the group at controlling other drinking individuals. Drinking also may increase the attribution of blameworthiness to a potential target or the labeling of otherwise innocent individuals as symbolic targets.

This leads to the second of the two questions raised at the outset of this chapter: How does alcohol mediate the arousal effects of specific social contexts to increase the likelihood of violence? Studies of barroom brawls typify this approach (Gottlieb 1957). Youth gangs and family violence, two well-studied areas also discussed below, are realms in which the intoxication-aggression relationship is well established but violence often also occurs in the absence of intoxi-

⁷Specifically, marijuana dealers recycled funds in their areas, leaving intact the major forms of informal and formal social control. But cocaine and crack dealers removed money and goods from circulation, changing the social organization of drug use and weakening the formal and informal social controls. Accordingly, the intoxication-violence relationship strengthened in this decade in the areas studied by Hamid. He concluded that a political economic analysis is necessary to understand the social controls on substance use and violence, apart from systemic violence associated with dealing.

cation. These perspectives illustrate the theories of cultural defense and social determinism that explain a significant portion of the intoxication-aggression relationship, and also provide examples of the interaction of motivations and restraints that shape violence while drinking.

Adolescent Groups and Youth Gangs

In this decade, gang violence increasingly has been linked to drug use and drug dealing (Fagan 1989; Mieczkowski 1986; Klein et al. 1988). But alcohol and marijuana use have always been, and continue to be, the most widely used substances among both gang and nongang youths (Fagan 1989, 1990*b*; Sheley and Wright 1993). Drinking and other contemporary drugs (mainly marijuana, until the 1970's) consistently are mentioned as a common part of gang life throughout the gang literature. For instance, Short and Strodtbeck's (1965) study of Chicago gangs showed that drinking was the second most common activity of gang members of all races, exceeded only by hanging out on the street corner.

The recent ethnographic literature on gangs (Stumphauzer et al. 1981; Hagedorn 1988; Vigil 1988; Campbell 1990; Moore 1992; Padilla 1992) also shows the commonplace occurrence of drinking and its place in a broad pattern of substance use. Dolan and Finney (1984) and Campbell (1990) illustrated the commonplace role of

drug use in gang life among both males and females. Stumphauzer et al. (1981) noted that use patterns varied within and among Los Angeles gangs and changed for individuals over time. MacLeod (1987) noted high rates of drinking among white gang members but only occasional beer use among the Brothers, a predominantly Black (but somewhat integrated) gang. Sanchez-Jankowski (1991) found that all members of all gangs drank regularly, using gang proceeds for collective purchases. Although they used drugs in varying patterns, alcohol was mentioned consistently. But Sanchez-Jankowski also mentioned that the Irish gangs least often used illicit drugs since access was controlled by nonwhites with whom they did not want to engage in business.

Vigil (1985, 1988) described a variety of meanings and roles of substances among Chicano gang members in east Los Angeles, from social "lubricant" during times of collective relaxation to facilitator for observance of ritual behaviors such as "locura" acts of violence. In these contexts, drug use provided a means of social status and acceptance, as well as mutual reinforcement, and was a natural social process of gang life.⁸ Vigil noted how gang members prepared for imminent fights with other gangs by drinking and smoking PCP-laced cigarettes. During social gatherings, the gang members used the same combinations to "kick back" and feel more relaxed among one

⁸Vigil noted that these patterns are confined to substances that enhance gang social processes—alcohol, marijuana, PCP, and crack cocaine. There is a sanction against heroin use among Chicano gangs. Heroin involvement is seen as a betrayal of the gang and the barrio: One cannot be loyal to his addiction and the addict ("tecató") culture while maintaining loyalty to the gang.

another. Evidently, gang members had substantial knowledge about the effects of alcohol (and its reactivity to PCP), and they had developed processes to adjust their reactions to the mood and behaviors they wanted.

Feldman et al. (1985) observed three distinct "styles" among Latino gangs in San Francisco that in part were determined by the role and meaning of substances in gang social processes. The "fighting" style included males in gangs who were antagonistic toward other gangs. They aggressively responded to any perceived move into their turf by other gangs or any outsider. Drinking and drug use were evident among these gangs, but use was only situationally related to their violence through territoriality. Violence occurred in many contexts unrelated to drug use or selling and was an important part of the social process of gang affiliation. The "entrepreneurial" style consisted of youths who were concerned with attaining social status by means of money and the things money can buy. They very often were active in small-scale illegal sales of marijuana, pill amphetamines, and PCP. While fighting and violence were part of this style, it was again situationally motivated by concerns over money or drugs. The last style was evident in gangs whose activities were social and recreational, with little or no evidence of fighting or violence but high rates of drinking and marijuana use.

Padilla's (1992) study of a Puerto Rican gang in Chicago described how alcohol and marijuana often accompanied the rituals of induction and expul-

sion of gang members. These ceremonies often were tearful and emotional, with strong references to ethnic solidarity. Padilla described how emotions intensified as the ceremony progressed, and drinking was a continuous process during the events.

Drinking or drug use also is disallowed in some youth gangs, regardless of the gang's involvement in drug selling. Chin (1990) found that intoxication was rejected almost entirely by Chinese gangs in New York City. They used violence to protect their business territories from encroachment by other gangs and to coerce their victims to participate in the gang's ventures. But "angry" violence was rare; violent transactions were limited to instrumental attacks on other gangs.

Cooper (1987) and Mieczkowski (1986) described organizations of adolescent drug sellers in Detroit who prohibited drug use among their members but tolerated drinking. Leaders in these groups were wary of threats to efficiency and security if street-level sellers were high, and to the potential for cooptation of its business goals if one of its members became involved with consumption of their goods. The gangs were organized around income and viewed drug use (but not alcohol) as detracting from the selling skills and productivity of its members. Expulsion from the gang resulted from breaking this rule, but other violent reprisals also were possible. However, gangs in both studies accepted recreational use of substances by members, primarily alcohol, marijuana, and cocaine, in social situations not involved with dealing.

In the Mieczkowski study, the sellers particularly found danger in being high on any drug while on the job, and superiors in the gang enforced the prohibition against heroin use while working by denying runners their consignment and, accordingly, shutting off their source of income. Violence was occasionally used by superiors (crew bosses) to enforce discipline. Gang members looked down on their heroin-using customers, despite having tried it at some point in their lives, which in part explains the general ideology of disapproval of heroin use.

Burns (1980) provided an ethnographic account of typical drinking behavior of male adolescents in Boston by charting the events of an evening of drinking and socializing with four young males from Charlestown, a homogeneous working class section of the city. The displays of aggression were integral to the social bonds between the young men and included 17 distinct aggressive acts.⁹ Their behaviors varied widely by type of setting. They were quiet and deferential in the local tavern with elder members of the Charlestown neighborhood. However, they were most aggressive in the downtown "adult entertainment" areas. Burns concluded that drinking served aggression and allowed them to express their masculinity, but the boys shifted their setting to a milieu where aggression was more acceptable, or where social controls were less salient. The boys in the Burns study drank beer to become aggressive, and the

more they drank, the more verbally and physically aggressive they became.

Buford (1991) depicted crowd violence among English football "supporters" as an inevitable consequence of the setting of football matches and the dynamics of crowds of youths. Expectancies of both intoxication and violence preceded the arrival of the "lads" at drinking locations surrounding the stadiums. The expectancies were played out in crowd behavior through rituals that were repeated before and throughout each match. Alcohol consumption before and during episodes of unrestrained crowd violence was an integral part of the group dynamic, but Buford does not attribute alcohol either as an excuse function or necessary ingredient for relaxation of social norms. In fact, he pointedly notes that the heaviest drinkers were incapacitated by inebriation and were ineffective rioters, while the crowd leaders were relatively light drinkers. In this context, alcohol was central but hardly necessary to the attainment of the expected behavior, and the setting itself provided the context and cues for violence.

Family Violence

There is widespread belief that intoxication, particularly drunkenness, is a major cause of wife beating and child abuse. Pleck (1987) traced these beliefs in American society to the Colonial era. Coleman and Straus (1983) found that almost one in four respondents to a Gallup poll believed alcohol to be the

⁹Loud conversation, good-natured wrestling, piling into a car, speeding, verbal boasting, verbal threatening, raucous comments, verbal disparagement, being rowdy, yelling, screaming, arguing, putting a fist through a store window, fighting, bottle crashing, threatening with a gun, and sexual aggressiveness.

cause of family violence. Winick (1983) described how popular culture portrayed the effects of drinking on wife beating. For example, in Tennessee Williams' *A Streetcar Named Desire*, a drunken Stanley Kowalski strikes his pregnant wife Stella, and later strikes his sister-in-law Blanche DuBois (herself a former alcoholic) on the night that Stella delivers their first baby. Similar episodes occurred in Edward Albee's *Who's Afraid of Virginia Woolf*, when George and Martha drink through the night and become increasingly abusive to each other, though only verbally.¹⁰ In *The Brothers Karamazov*, Dostoevski hints (but does not directly imply) that alcohol may have led Dmitri to kill his father. Kantor and Straus (1987) pointed out that these images not only link drug use and aggression, but also directly attribute stranger and family violence to intoxication and portray it as an underclass phenomenon.

The empirical evidence on the contributions of intoxication to aggression in families is equivocal. Wolfgang (1958; see also Wolfgang and Strohm 1956) coined the phrase "victim-precipitated homicides" based on the incidence of intoxication of homicide victims, including victims of domestic homicides. Kantor and Straus (1987) reviewed 15 empirical studies on alcohol and spouse assault, and found a wide range of reports of the presence of alcohol—from 6 to 85 percent. Fagan et al. (1983) reported that the severity of spouse abuse was positively associated with alcohol use by the assailant, but

there was a weak, negative association with use of other substances. Coleman and Straus (1983) suggested that although reports of alcohol use are high among spouse abusers, the rates are no higher than among the general population. Bard and Zacker (1974) concluded that the relationship between spouse abuse and alcohol use was spurious.

Establishing a precise relationship is made difficult by variation in measures of spouse assault, alcohol or drug use (frequency, severity of intoxication and impairment), and the variety of sampling and research designs. Hotaling and Sugarman (1986) developed risk markers for spouse assault based on analyses of case-control studies of spouse and child abuse. They concentrated on the effect sizes of variables across studies that met minimal design criteria. Alcohol was one of the variables that met their criteria of a positive, significant association in two-thirds of the studies in their analysis to establish it as a risk factor for husband-to-wife violence. Abuse of other substances was not found to be a significant risk factor that was positively correlated with spouse assault. Rather, they found an equal number of studies that indicated either positive or negative associations of spouse abuse with other substances. Accordingly, alcohol appears to be a significant correlate of wife abuse, but not child abuse, while drug use is associated with neither form of intrafamily violence.

Two studies examined the incidence of alcohol use in a nationally representa-

¹⁰Martha's sexual advances toward their young male dinner guest also illustrated the image of alcohol as a disinhibitor of sexual behaviors as well as aggression.

tive population of families. Coleman and Straus (1983) analyzed data from a 1975 nationwide survey of a representative sample of 2,143 American couples (married and cohabitating) who were interviewed on the frequency of violence between partners in the relationship, and the frequency of intoxication from alcohol. The results showed a positive association between the frequency of alcohol consumption and violence between cohabitants. Rates of violence were nearly 15 times greater for husbands who were drunk "often" compared to "never" during the past year.¹¹

In the second study, Kantor and Straus (1987) analyzed data from telephone interviews conducted in 1983 with a nationally representative sample of 5,159 households.¹² Unlike the Coleman and Straus (1983) study, this study asked if there was drinking at the time of a violent incident. In 76 percent of the households where violence occurred, alcohol was *not* used immediately prior to the incident. However, controlling for respondents' *usual* drinking patterns, there was a positive association between the percent who were violent and drinking immediately prior to the violent incident. Among "binge" drinkers, nearly half (48.4 percent) were drinking prior to a violent episode, compared to fewer than

one in five (19.4 percent) for "infrequent" drinkers. The authors caution that over 80 percent of all respondents in the highest frequency drinking categories did not assault their female partners *at all* in the past year, and nearly two-thirds of blue-collar workers were nonviolent during the study year.

Star (1980) characterized persons violent toward family members as needing power and control, and likened violent spouses to alcohol users in such characteristics as extreme jealousy, external blame, sexual dysfunction, and bizarre mood shifts. Speiker (1983) found that both spouse abusers and their victims tended to blame alcohol for the violence, and that men used it as an excuse for their violence. Coleman and Straus (1983) drew on deviance disavowal theories to explain behaviors among people who do not view themselves (or their behaviors) as deviant, but need some excuse (such as alcohol) for their unacceptable behavior. By "explaining" violence toward spouses as the result of intoxication, their social standing and self-image are preserved. The behavior is deviant, but not the individual. Intoxication provides a "time out" for such deviance to occur.

Similar to processes described by MacAndrew and Edgerton (1969), the norms for conventional and appropriate

¹¹However, for men who were the most frequent alcohol users (i.e., those who were "almost always" drunk), violence rates were half those of the "often" drunk respondents. The survey did not inquire whether violence occurred while either of the partners were intoxicated. The authors conclude that the heaviest drinkers are "anesthetized," both emotionally and physiologically, and incapacitated from violence.

¹²Eligible households included an adult female (over 18 years of age) who was either married, recently divorced or separated (within the past 2 years), not married but cohabitating with a male as a "couple," or a single parent with a minor (less than 18 years of age) child in the household.

behavior were set aside temporarily. However, the process of redefinition uses some external factor (e.g., intoxicants), rather than a conscious decision to behave outside acceptable boundaries. Coleman and Straus (1983) suggested that these processes actually could promote the behavior by offering an advance excuse for their acts. This is similar to the behaviors of gang members and others whose use of substances is designed to create the circumstances in which violence can occur.

Both the Kantor and Straus (1987) and Coleman and Straus (1983) studies also suggest that expectancy develops via social learning processes. They concluded that persons learn reactions to alcohol and behaviors while intoxicated through observations in the family context. Other theories also would apply, if we accept the claims of Star (1980) and Spieker (1983) that violence in the family is an expression of power and control. Power motivation theory (McClelland and Davis 1972; McClelland 1975) suggests that drinking and violence both may be means of asserting power and control in the family. However, other studies of family violence (Dobash and Dobash 1979; Bowker 1983) concluded that the maintenance of masculine power and control is a motivation for domestic violence, independent of external factors and without explicit disavowal of their acts.

Dobash and Dobash (1979) claimed that socioeconomic status interacts with alcohol intoxication to increase the severity of violence.¹³ Bowker (1983) found

that the men most violent toward spouses were working class men who were most deeply embedded in "male subcultures," as measured by time spent *in bars* with male comrades. However, the intoxication-family aggression relationship is present even when there is disapproval of violence and among middle class men. Accordingly, it is likely that for middle class men, processes of deviance disavowal and "time out" may permit the assault of spouses. For working class men, expectancy of behaviors during intoxication, reinforced by both social learning experiences and societal approval for the use of force within families to assert and maintain supremacy, contributes to violence during intoxication. Kantor and Straus (1987) suggested that both processes operate among working class men.

Thus, the interaction of personality, social network, situation or setting, and cultural norms provides a powerful influence on individual behaviors while intoxicated in the family (and among strangers, as illustrated by Burns' study of the Charlestown youths). Although most violence occurs in the absence of alcohol or other intoxication, the family provides both provocation and context for the onset of family violence. Problematic drinking is intrinsic to this context and may contribute to the stability of aggression over a "battering career."

Barrooms and Public Drinking Places

Barroom brawls are common features of American folklore and help reinforce pop-

¹³This does not deny the distribution of family violence across social classes. See Straus et al. (1980) and Straus and Gelles (1986).

ular beliefs about the alcohol-violence relationship. Taverns have been the focus of social control efforts since the 1800's (Roncek and Maier 1991), with the most recent efforts including "happy hour" legislation to restrict alcohol use among drivers. Public drinking places, especially bars but also including sports stadiums and skid rows, provide special contexts for viewing the dynamics of drinking and violence (see for example Gottlieb 1957; Cavan 1966; Anderson 1978; Burns 1980). Roncek and Maier (1991) suggested several reasons why taverns are drinking locations with high rates of violence. In bars, people often carry cash and become convenient targets for robbery (especially if they are intoxicated). Even if insulated from would-be attackers while in the bar, patrons are available targets for physical aggression by other patrons simply by their intoxicated state.

Second, the taverns themselves are likely to have cash on hand if not valuables from their customers. They are open for long hours, often into the late night and early morning when there are fewer people on the streets and anonymity increases. By advertising themselves (via signs) to attract customers, they also signal others that there are people inside who are drinking and that there is cash on hand in the till as well as in the pockets of the patrons. They are highly accessible (usually it costs nothing to go inside), and they offer anonymity and, depending on location, isolation.

Third, drinkers are likely to behave differently than when sober, and differently from those not drinking. Bar

patrons drink in locations away from their intimate handlers, or the people and relationships that exert social control—spouses or other family members, employers or coworkers, neighbors, and police officers.

Fourth, bars bring together people who may not be well acquainted with one another; when this volume reaches some tipping point, it strains the social control functions within the bar setting. The increase in the number of people unknown to each other decreases the willingness and effectiveness of people without social connections to undertake guardianship functions of social control (Frisbie et al. 1977).

These dynamics are consistent with routine activities theories of crime (Cohen and Felson 1979), a theoretical framework that stresses the dynamics and physical setting where potential offenders and victims come into contact. Frequent victimization has been associated in several studies with higher offending rates, suggesting an ecological dynamic within these settings (Fagan et al. 1987; Sampson and Lauritsen 1993). More recent articulations of routine activities theories (Felson 1987) include not only "predatory" crimes but also competitive offenses resulting from the airing of interpersonal disagreements. There is a rich literature that suggests that bars are examples of settings that can lead to competitive violations, including both fights and more serious assaults (Roncek and Maier 1991). In particular, because bars attract younger people, and age is a strong correlate of violence, the risk factors for violent transactions are concen-

trated and highly salient within bars. Moreover, if bars become known as locations where disputes can be resolved with violence, they may well attract people with propensities to form grievances and settle them in that fashion.

But there are many different types of bars, and not all of them have violent episodes. People drink in bars for different reasons, from social relaxation to business meetings to entertainment. There are quiet little places with live music and then there are dance halls with rockabilly bands where bartenders serve buckets of beer through small openings in concrete walls. There are afterhours clubs and neighborhood taverns. The atmosphere of these different types of bars in part shapes the styles of drinking and the norms of drunken comportment. The bar regulates the amount of aggression that can be expressed and which expressions of violence are tolerated (Gibbs 1985). There also are norms for the types of interactions that may escalate into violence, such as rules over gambling, the pool table, or darts. Some bars post rules (e.g., no cash gambling); others rely on social enforcement by regular patrons.

Bars vary in their social control mechanisms. Some exert their influence by regulating the mix of clients who are allowed to enter. Others involve the bartender in dispute resolution. The expectations among other clients to remain neutral in disputes not involving them is especially important for containing violent events in bars (Gibbs 1985; Frisbie et al. 1977) and other contexts (Felson 1987). Whether people are well known to one another and

hence part of some social network also provides a structure for audience roles in not allowing a beery argument to escalate into a drunken brawl.

Bars also seem to reflect concentrated versions of the factors that facilitate violent encounters elsewhere. Graham and colleagues' (1980) designation of "skid row aggressive" bars included factors such as population heterogeneity, concentrations of young people, people with low social stakes (e.g., unemployed workers, workers in illegal trades such as drug dealing or prostitution), impersonal interactions between patrons and staff, crowding, shabby decor, and high rates of intoxication. These same factors describe the characteristics of urban social contexts that also have high violence rates (Sampson and Lauritsen 1993).

Certainly, the interaction of young adult males with increasing amounts of alcohol creates the potential for violence. But these structural conditions alone are insufficient to explain why violence occurs more often in bars than other locales, or more often in some bars than others. The semiotic meaning of violence in these settings also determines the likelihood and direction of violence. Black's (1983) interpretation of crime as social control accounts for violence that occurs in response to the belief that a norm has been violated. Aggressive episodes may begin when someone believes that a norm has been violated and initiates some retributive or deterrent act, usually a verbal warning. A verbal reprimand, if believed unjust, may provoke a retaliatory act, either for retribution (again) or simply to

save face. The escalation of these forms of "angry aggression" (Bernard 1990) into physical assaults may be a short leap when the parties have been drinking and social cognitions of threats or cues are distorted (Fagan 1990a).

Bars are locales where such rule violations are more common, in part because they are locales where social control is problematic. Refusals to serve liquor (particularly to violence-prone underage patrons who have been drinking elsewhere) are provocations for disputes with the staff. Drinking itself may alter patterns of interaction: Tact is less likely after drinking (Felson 1987). The bartender's or bouncer's authority may not be recognized, especially by infrequent visitors and younger patrons.

Felson et al. (1986) studied violence in 131 bars in New York and 67 bars in Ireland. They reported that the content of disputes was similar, with refusals to serve as the most frequent source of violent disputes. Other frequent causes were disputes over the opposite sex, insults, and disruptive behavior. The extent of intoxication explained escalation from verbal disputes to physical violence. Only in the Irish bars were politics frequently mentioned as a source of disputes. Overall, age was the best predictor of

physical aggression in bars, and youths were more likely to fight when they were in a bar with a younger clientele than when the population was age graded. But the authors also discounted the importance of intoxication.

The importance of anger over refusals to serve suggests problems with social control functions in bars and other public drinking locations. The sequences of escalatory moves, the social control functions of the violence itself, and the face-saving role of counteraggression suggests that self-image and impression management (Felson 1982) are important functions of barroom violence.¹⁴

These same themes appear in studies of other social drinking locations (Cavan 1966; Anderson 1978) and in the adolescent studies cited earlier (Burns 1980). Impression management is an important theme in violence (see Liebow 1967, pp.186-188, for an illustration of how violence becomes a contest of characters, and Campbell 1990 for illustrations with gang members). To the extent that intoxication intervenes in the going rates of such disputes, impairs cognition that interprets threats and cues, and intensifies or dampens emotions and arousal, alcohol will play a critical role in the context of violent events.¹⁵

¹⁴Power-motivation theories (McClelland et al. 1972; McClelland 1975) interpret the motivation for drinking as enhancement of personal power, particularly the power to gain victories in confrontations with personal adversaries. This perspective suggests that violence can occur during drinking episodes when an intoxicated male may resort to violence to win in a conflict situation.

¹⁵There is substantial evidence that alcohol impairs cognitive functioning. Perneran (1981) developed a model in which intoxication has a disorganizing effect on cognitive functions, especially the ability to process the cues of communication and a general narrowing of the perceptual field. In turn, this may lead to a random determination of behavior, rather than the contingent behaviors that result from accurate perceptions of social cues. Accordingly, an interpretation of another person's behavior as arbitrary can lead to aggressive behavior.

AN INTEGRATED PERSPECTIVE ON AGGRESSION FOLLOWING INTOXICATION

The extent to which alcohol and setting interact to mediate violence seems to center on the effects of alcohol on both motivations and restraints or social controls. The onset of violence following drinking events reflects a push and pull between the arousal effects of alcohol on motivations and the neutralization of restraints either within individuals or situations. No single framework can be expected to explain what obviously is an extremely complex relationship between alcohol and aggression. Nor can any framework explain the variation in why people drink (or get high) and the unique outcomes even in similar circumstances. What we can reasonably do is identify the processes and variables that contribute to this relationship and suggest possible mechanisms that weave them together.

The evidence from several disciplines suggests that individual attributes, both psychological and physiological, combine with cognitive and emotional factors that are interpreted through social psychological contexts and situational factors to explain the interaction between substance, and individual, set, culture, and behavior. (See, for example, reviews by Collins 1988*a,b*.) Social networks and their cultural milieu influence the social construction of substance use patterns and regulate the behaviors that occur during drinking episodes.

Evidence from the studies of both alcohol and drug use on interpersonal aggression converges in one critical area:

Intoxication affects cognitive processes that shape and interpret perceptions of both one's own physiology (i.e., expectancy) and their associated behavioral response. These cognitive processes themselves are embedded in sociocultural contexts and processes that shape the norms, beliefs, and sanctions regarding behaviors following intoxication.

In developing a general framework for viewing the influence of social processes on alcohol-related violence, Collins (1983) suggested two major independent variables that increase the probability of violence during social interactions following alcohol use: (1) psychological proclivity toward the exercise of personal power in an overt manner, and (2) beliefs that alcohol causes aggression. Each of these factors in turn influences cognitive processes that interpret both the situation and the appropriate behavioral response. One effect of alcohol on cognitive process is a reduction in behavioral repertoire. Accordingly, violence may result from either personal proclivity (or personality) or cultural beliefs, forces that further proscribe responses to social interactions during drinking situations.

Propensity, a factor that operates primarily at the individual level, involves the use of coercion (either verbal or physical) to resolve perceived conflicts. Beliefs about permitted behaviors while drinking may be expressed through the individual who believes, as does the society, that intoxication (especially drunkenness) induces aggression. But these beliefs also shape the norms that are traded among

individuals within social networks that exert social control and determine the boundaries of permitted or nontolerated behaviors. Sociocultural processes therefore have direct effects (through both expectancy and the regulating social norms of drinking cohorts) and indirect effects through its influence on mediating cognitive processes. Beliefs and cultural norms about alcohol also are likely to produce "accounts" (Scott and Lyman 1968) that allow drinkers to shift blame to alcohol and therefore perceive fewer social rules against aggressive behaviors.

The empirical evidence for both drugs and alcohol suggests that individual behaviors vary by set and setting; that is, the same individual consuming the same substance will behave differently in different situations. For example, gang members use alcohol in two distinctly different contexts: to embolden members for aggression in one setting, and to socially cohere the group in another (Moore 1978; Vigil 1988). Beliefs about behaviors that are permissible, and the effects of specific substances, are determined by processes that are primarily social, that are enforced through social controls (social approval, social opprobria) within communities or settings, and that vary by situation. Drug or alcohol use behaviors themselves vary by social setting and are shaped by the norms and rituals of the setting. These may include social norms that either promote or impede aggression. Also, cognition interacts with social cues to produce an interpretation of the setting where drinking or drug use takes place, while personality variables also affect the cues

(and their interpretation) that trigger cognitive reactions. This suggests three processes that are needed to explain aggression following intoxication: First, the probability of exposure to a situation that is associated with aggression; second, the probability that an individual will react aggressively when exposed to the same contextual stimuli; and, third, the probability that the factors favoring an aggressive response outweigh the restraints or sanctions against it.

In sum, rather than being a linear process, aggression following intoxication more likely is a reciprocal process in which expectancies and physiological factors, social norms and events in specific situations where substances are used, and cultural factors have multiple and recursive interactions leading to aggressive or nonaggressive behaviors when intoxicated. That is, situational variables and group processes (conveyed through social learning processes) are likely to affect variations in the behaviors that follow intoxication, and these relationships then will alter the individual's selection of contexts, as well as his or her social construction or cognitive interpretation of these contexts, and will affect the probability of aggressive behaviors in subsequent encounters. The influence of larger political economic and social organizational influences on culture and social controls on drug use and aggression also must be acknowledged.

Emerging from this perspective are constructs presented in table 1. Social structural factors shape the composition of populations and the physical attributes

TABLE I

Factors Influencing Alcohol-related and Drug-related Violent Events

Individual factors

Psychopharmacological effects of alcohol or illicit drugs

- Arousal effects of the drug
- Dose
- Delivery method

Physiology

- Body weight
- Metabolism

Personality

- Proclivities to exercise power in an overt manner
- Balance or imbalance of emotional states (rage, shame, guilt, fear) and conditional responses about behavior reactions
- "Hypermasculinity," skewed sex roles socialization
- Impression management tactics

Motivations

- Power motivations
- Hypermasculinity creating imperatives for violence
- Exercise of power/autonomy

Developmental experiences of the actor

- Selection of people and settings for interactions
- Behavioral repertoire (learned and conditional behaviors)
- Probability of responding aggressively to provocation

Cognition and situational arousal

Cognition

- Perception or attributes of threat
- Interpretation of cues, provocation, or instigation
- Techniques of neutralization of behaviors
- Perceptions of deterrents and weight of social costs of violence

Sociocultural beliefs

- About substances (fuel for cultural defense and accounts)
- About desirable and appropriate behaviors when intoxicated
- About person–setting interactions: appropriateness, environment, gender roles, behaviors

Arousal

- Physical arousal (anger, fight/flight response, fear, rage)
- Situational arousal (low social position, conflicts, aggressive environment, face-losing incidents)

TABLE I (CONT'D)

Contextual factors

Social structural factors

- Human ecological balance: age/gender/race/income composition, population mobility, strength of kinship and friendship networks
- Social and economic isolation of the social area, heterogeneity of the area
- "Stakes" in larger society: salience of work opportunities, institutional influences within the area, opportunities to achieve expectations for social roles and social position

Attributes of the setting

- Anonymity of actors
- Type, amount, and rate of substances consumed
- Composition of the actors, number of people
- Salience/formality of immediate restraints or deterrents in the setting
- Cohesion or salience of rules within the setting for the group present, methods of enforcement (social controls)
- Availability of weapons

Transactional influences

- Moment-to-moment sequences of behavior that may escalate or contain aggressive interactions
- Dispute resolution practices, "naming/claiming" that escalates interactions
- Social coercion or pressures
- Mutuality of violence, balance of cognitive styles

of the area. The strength of social networks and their ability to sanction or control behaviors will depend on the economic circumstances of the community. Social isolation of communities and the "stakes in conformity" of its residents with conventional society will influence their ability to exert social control (Sampson and Wilson 1991).

Sociocultural factors include beliefs about permitted behaviors for each substance and the meaning of substances in various cultural processes and subcultural groups (ceremonies, spiritual or religious uses, social interaction). These factors in part determine the settings where substances are used and influence individual choices about when and where to use them.

The settings and social contexts also influence the choice of substance, convey the rules and norms proscribing behaviors, and affect the cognitive interpretation of the situation and, accordingly, the probability of aggression in that situation. Thus, social control of drinking situations reflects the situational ecology of the setting—the anonymity of people within a setting, their age-gender-race composition, and the salience of the rules of the setting itself.

The psychoactive properties of various substances, their availability, and individual physiological and psychological factors are exogenous factors that influence other social psychological processes. An example of an individual personality factor is the

propensity to use violence to resolve interpersonal conflicts, or the habit strength of violence that has been socially reinforced through past experiences during stages of social and personality development.

Arousal is a critical component of this framework. While alcohol results in physiological arousal; situations or events themselves may produce arousal, fear, anger, and annoyance. For example, they often are the immediate provocations for violence arising out of trivial conflicts (Bernard 1990). Once causality and blameworthiness have been attributed to another actor in the setting, arousal may transform into anger focused at that actor. At times, a symbolic target may substitute for the "real" target when it is not available.

The sources of situational arousal include distal influences (social position, crowding) and proximal influences (incidents of discrimination, an aggressive environment threatening one's image). The transition from arousal to violence requires a motivational component. Motivations for drinking, such as power-control needs (McClelland et al. 1972), interact with proclivities for violence and other social cues leading to violence. Skewed conceptions of manhood, fueled by frustration in achieving any of the legal or conventional hallmarks of that status, underlie much violence and are evident in the barroom, family setting, and gang situations where violence often ensues (Fagan 1990a). These themes also have been noted in street corner scenes where

violent scuffles often occur, usually in the context of drinking and social comparisons (Liebow 1967; Anderson 1978).

The interaction between personality and social context to produce controlled or uncontrolled substance use and to manage aggression is critical to this framework. Individuals form perceptions of their environments and internalize the expected responses to social situations through the development of personality. Social learning processes affect these internal perceptions and the capacity to activate internal controls. Experiences with intoxicants, both psychoactive and social experiences, socialize users not only to the effects of the substance but also to the expected social behaviors that accompany that state.

Zinberg (1984) suggested that individuals select explanatory constructs from a range of cognitive and emotional perceptions available to them, and their responses would follow the available explanations of their situation. The boundaries of those responses are determined by three factors: perceptions of the expected environment, personality variables such as relative ego autonomy, and responses to the substance itself. These three processes are influenced strongly by social learning processes. Social learning processes teach users about the expected behaviors in various social settings, determine perceptions of the psychoactive effects of the substance itself,¹⁶ and also influence personality factors by raising apprehensions about danger or moral ambiguity. The delicate interplay of these

¹⁶See Becker (1967) for a description of how social learning processes were influential in determining responses to LSD.

factors is sensitive to the social cues of the setting where substances are used and reciprocally may determine the selection of setting where people go to use substances. From these cues, aggression may follow logically from the controls that are internally activated and the social controls present in the setting.

However, unlike a linear model, these relationships also have "backward" effects on the same social processes. For example, an individual who is apt to exhibit aggressive behaviors in bars is unlikely to select bars in which aggression is negatively sanctioned. Alternatively, an individual may choose to use substances he or she can manage effectively to remain in a social context that has some utilitarian value or emotional attachment. At the social and cultural levels, weak social organization may permit or promote certain specific forms of intoxicated behaviors at the group or neighborhood level.

Thus, patterns of aggression following intoxication develop over time through socialization within specific social contexts and the shaping of behaviors through social learning processes. Individuals may initially have diverse experiences with settings and substances, but ultimately they are likely to gravitate toward social contexts that offer a match between personal proclivities and the social rituals of that scene. However, such personal proclivities also may include a desire for acceptance in nonviolent social worlds, and accordingly selective processes of affiliation may ensue depending on the type of social gratification sought.

CONCLUSIONS

The variation in intoxicated behaviors within social contexts suggests that the context itself exerts a powerful influence on the violence outcomes of drinking situations, one that is far greater than the effects of the substance itself. Ethnographic research tends to downplay the significance of alcohol (Pernanen 1991), while sociocultural studies view alcohol or other substances as embedded in the cognitive landscapes and social dynamics of drinking settings (Zinberg 1984). In part, the institutionalized aspects of drinking and alcohol-related behaviors tend to focus theoretical attention on the dynamics of the setting where drinking rituals are played out.

However, these perspectives overlook the individual-level effects of alcohol and other intoxicants, ignore person-substance and place-substance interactions, and accordingly suffer from several theoretical shortcomings. First, they lack specificity on the concept of context and setting. The importance of social context for alcoholic-related violence lies in the mediating processes that shape behaviors as well as in the specific interactions leading to violence between drinkers. These mediating processes influence the formal and informal social controls that regulate behaviors. Social control may involve the myriad rules described by Zinberg (1984), the internalized social controls (norms, restraints) that are the products of socialization and human development (Gottfredson and Hirschi 1990), or the balance of informal rules of the setting with formal legal controls (see Black 1976 on the "quantity of law").

Second, they overlook the likelihood that the rules and norms within a socio-cultural context are in part shaped by behaviors that are the result of physiological and psychological effects of alcohol. Drinking habits and patterns exert an influence on the types of alcohol served and other dimensions of access. Rowdy, unpredictable, or aggressive behaviors when drinking will evoke social responses such as regulation of quantities or hours of service, use of bouncers or other security, control of admission, or display of preventive messages promoting self-control, tact, or restraint. The reactivity of locales to drinker-situation interactions to produce social reactions are an important dimension of social control.

This leads to the third shortcoming, that alcohol is a component of the situational ecology of drinking contexts that is inseparable from the influences of the context. Social controls within locations or within social networks where alcohol is consumed reflect the real and expected behaviors of the individuals who drink there as well as those who maintain the setting (and are social control agents). In rockabilly bars or metal clubs where a young clientele dances to loud house bands, drinks are dispensed in a way that recognizes the need to control access and protect the dispensers. Security also is heavy. These locales in turn obtain an identity that may lead to a social- and self-selection of individuals who choose to go there.

Accordingly, the social controls for alcohol within a setting develop in response to the situation-drinker interac-

tions that occur there. In locales where the participants disproportionately are young males, social controls are challenged by the aggressiveness of that age group coupled with the arousal effects of alcohol. Drinkers also are guided by their thematic interpretations of social (interpersonal) interactions, and these interpretations are influenced by alcohol-personality interactions. Thus, if drinkers bring sources of situational arousal to a setting (e.g., being out of work, face loss at home or among friends), their interpretation of cues may be guided in the direction of finding a blameworthy target for their grievances. If a locale is dominated by people with such grievances, the social controls within the scene are hard pressed to avoid an escalation into violence.

Drinking situations or locales themselves are embedded in communities, where larger social processes also influence the behaviors of drinkers. Rates of interpersonal violence vary inversely with the strengths of social networks and other informal social controls (Taylor and Covington 1988; Sampson and Lauritsen 1993). If communities are ineffective at controlling violence more generally, the base rates of violence will increase the likelihood of violence in drinking situations under conditions of physiological and situational arousal.

Community-level social controls reflect social structural influences and are influenced by the networks and social capital of the individuals within them. Increasing poverty, social isolation, attenuation of social networks, and declining labor force participation (especially

among young nonwhite males) generally compromise neighborhood controls against violence (Sampson and Wilson 1991). Detachment from the labor force preempts the controlling function of threats of job loss and social stigma. These processes also influence the situated social control of families within neighborhoods by minimizing the potential effects of job loss as a social cost of drinking-related violence.

These dynamics suggest that social controls of drinking behaviors are bound up with macrosocial processes of social control. Such controls are likely to vary in efficacy across social areas of varying economic strength and cohesion. Implicit in these processes is the role of political economy of place in generating structural contexts that mediate social controls. To the extent that drinking and violence patterns both may reflect the integration of communities within the larger society, their social isolation sets forth social processes that skew behaviors and weaken the ability of communities to regulate them. The deficits in power and control that accrue to males in conditions of chronic unemployment or unfulfilled social goals, and the devaluation of life that occurs in impoverished communities, are strong risk factors for violence and serve as arousal mechanisms following intoxication (Hawkins 1987).

The day-to-day interactions within socially isolated or disorganized communities create an unending supply of the triggers, motivations, and arousal to escalate routine conflicts into "angry aggression" (Bernard 1990). The specific

motivations may range from the accumulated anger of a "devalued life" (Hawkins 1987) to the routinized violence among victims and offenders (Fagan et al. 1987) to the emotional arousal of powerlessness (Browne and Dutton 1990) and the deindividuation of violence (Dutton et al. 1982). The effects of alcohol within these contexts are more likely to lead to thematic interpretations of personal interactions supportive of violence.

This framework is a first step in articulating reciprocal processes that operate at multiple levels to explain sociocultural processes underlying intoxication-aggression relationships. One task for future research is to learn the forms of these interactions and the processes by which factors at one level of influence are linked to processes at another level. Thus, the origins of controlled use and the social processes that support it are critical to understand as are the methods by which groups enforce and communicate those norms and regulate behaviors.

To further specify this framework, research is needed that compares violence rates in communities that vary by social structural dimensions and informal social controls. This involves community studies that examine not only patterns of victimization but also specific events and patterns of drinking-related violence. Questions regarding processes that facilitate or restrain violence during drinking events will be answered through multi-method analyses involving experiments in different social contexts with different substances, surveys in different cultures and social groups, aggregate data analysis of

consumption and behavioral patterns, and ethnographic reports to unravel multilevel causal sequences and reciprocal effects.

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Economic Perspectives on Reducing Alcohol-Related Violence

Philip J. Cook¹ and Michael J. Moore²

Drinking engenders violence. Under the influence of alcohol, a parent may be provoked to strike an irritating child; a college student may forcefully insist on having sex with his date; friends may escalate an argument into a bloody fight; a robbery victim may foolishly attempt resistance in the face of a loaded gun; soccer fans may riot in response to an unsatisfactory game. Some individuals under certain circumstances are more prone to violence, or to provoking violence, when drinking than when sober.

Our understanding of alcohol-related violence has been enhanced by the contributions of biochemistry, psychology, and cultural anthropology, as documented by other chapters in this volume. Economists have not contributed much to the discussion. The presumption of individual rationality is central to the economic paradigm, and this presumption seems unpromising as a framework for analyzing drunken comportment. Still, drinking does affect the costs and benefits of engaging in violence, and these changes

are arguably relevant to individual decisions concerning where and when to drink and how to behave when under the influence. We offer a few thoughts on this subject in the next section.

One strategy for reducing alcohol-related violence is to restrict alcohol availability. Economists and other policy scientists have demonstrated that interventions which make alcoholic beverages more scarce can reduce other costly consequences of alcohol abuse, most importantly traffic fatalities. We illustrate this approach by presenting new empirical results on how State alcohol taxes affect rates of criminal violence. Our results suggest that there is a close link between taxes and per capita consumption, which in turn is closely linked to rates of homicide, rape, robbery, and assault. There is also evidence of a direct link between tax and violence rates in these data.

Those policy interventions that are shown to be effective in reducing harmful consequences should be further evaluated to determine whether their benefits

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exceed their costs. In order to make a direct comparison between costs and benefits it is necessary to use a single unit of account, typically dollars. There are difficult philosophical and practical problems in how to assign monetary equivalents to fear, pain, physical incapacity, and bereavement. The accounting method incorporated in most evaluations is based on the "cost of illness" framework developed by Dorothy Rice and her associates (1990). This framework has been criticized by economists because it differs in important respects from the cost-benefit framework of economics. Some of the differences and their consequences are explored here. A concluding section offers suggestions for future research.

We make a general observation before proceeding. A number of behavioral and social scientists have discounted the policy relevance of the association between drinking and violence, arguing that this association is not the result of a direct causal relationship. The alcohol-violence link has also been downplayed in the public debate over alcohol policies, perhaps due to the widespread impression that the victims of alcohol-related violence (unlike, say, the victims of drunken drivers) tend to be culpable in some fashion. Our own view, which is given some support in what follows, is that policies that are effective at curtailing the prevalence of alcohol abuse will reduce rates of homicide and other violent crimes. Furthermore, we are not convinced that there are proportionately more "innocent" victims in alcohol-related traffic accidents than in alcohol-related crimes.

ALCOHOL-RELATED VIOLENCE IN A RATIONAL CHOICE FRAMEWORK

Economists seek to explain behavior as the result of rational decisions made by individuals who assess their alternatives and choose the one that has the most favorable consequences given their tastes. The economics framework thus establishes a strong presumption that behavior follows choice and choice reflects the benefits and costs of the available options. Given what we all "know" about drinking, the usefulness of this approach may be questioned. Alcohol impairs and distorts cognitive process, causing confusion and shortsightedness. Still, the "rational choice" approach received some support from a recent study by Kai Pernaenen (1991).

By way of introduction, Pernaenen noted that

Recent years have seen a shift in viewing many alcohol-related phenomena away from a "free will" perspective, and an inclusion of a growing number of these into the paradigms of natural science. There has been a parallel shift from the personal responsibility of the drinker to the substance of alcohol and to physiological factors residing within the drinker. (pp. 14-15)

Yet on the basis of his recent research on violence in a Canadian community, Pernaenen concluded that alcohol-related violence, like sober violence, can be

understood in terms of normal human motivation.

The objectives of violent behavior in the population studied were in large measure instrumental and transactional, both in a sober and in a drunken state...[R]esorting to physical violence and using specific acts, as well as the resulting pain and injury, do not in essential respects differ when assailants have been drinking and when they are sober. (p. 217)

In other words, alcohol-related violence is not mindless; it is purposeful and can be understood as the assailant's tactic for achieving some valued goal.

In applying the decision framework to understanding the drinker's behavior, the central issue is why some drinkers are more likely to engage in violent acts when drinking than when sober. One possibility that fits the paradigm is that drinking engenders violence by changing the objective consequences of engaging in violence. A man who abuses his wife or children may have reason to expect that they will attribute his viciousness to "demon rum" rather than hold him directly responsible

for his actions. If his abusiveness is attributed to his drinking rather than his character or the quality of his feelings for his family, then his victims may be more inclined to forgive him.³

As a quite different matter, drinking may change the objective consequences of a violent attack via its anesthetic property. The risk of traumatic injury from getting in a fight is less daunting if, at least initially, the pain will be dulled by alcohol.

The decision framework incorporates subjective preferences as well as objective consequences. Drinking may change the individual's valuation of the consequences of engaging in or provoking violence, making such behavior seem more attractive than it would if he or she were sober. Intoxication tends to increase the subjective importance of immediate urges relative to the remote consequences of acting on these urges. Alcohol can serve as a sort of mental anesthetic, dulling the pains of conscience and narrowing cognitive scope.⁴ The result is that decisions made while under the influence of alcohol may be at odds with an individual's preferences when sober. The woman who abuses her children may suffer remorse when she sobers up; the man who provokes his drinking companion into a fight and ends

³ See, for example, McCaghy (1968) and the discussion in Lang (this volume). Criminal justice penalties may also be influenced by whether the defendant was drinking at the time of his assault. The law in North Carolina, for example, stipulates that intoxication is a defense against premeditated murder (Clarke et al. 1978, p. 5-2). It has been asserted that judges and juries tend to be more lenient if the defendant was intoxicated at the time of his crime (Kleiman 1992, p. 221), although we know of no systematic evidence on this matter.

⁴ Steele and Josephs (1990) provided support for the importance of "alcohol myopia" in their review of laboratory and field research on how social responses are influenced by drinking. They observe that the evidence "identifies a pervasive condition under which alcohol causes drunken excess: in simplest terms, whenever salient cues provoke a person to do something that if he were sober, remoter cues and thoughts would pressure him to inhibit" (p. 926).

up with a serious injury will surely experience regret. There is always a strong human tendency to discount the future in making decisions (Herrnstein 1974), and alcohol exacerbates this tendency; in some circumstances, that change may engender violent behavior.

While a single instance of "uncharacteristic" violence can be understood in terms of alcohol-induced "myopia" with respect to the future, it is more difficult to understand people who almost routinely repeat the cycle of drinking, violence, and regret. How can such behavior fit into a rational choice framework, given that they could avoid trouble that surely is foreseeable by making the decision (when sober) not to start drinking? One answer would stress the importance of time discounting even among sober "rational" people: The sequence of events in this cycle places the pleasures of drinking before the pain of regret, and for that reason the pleasure receives disproportionate weight in the decision. A conceptually more innovative answer requires that we enlarge the rational choice framework to admit the possibility of internal conflict.

Several economists have proposed decision models that postulate conflicting sets of preferences and attempt to characterize the internal struggle to determine which preferences will dominate at any given moment (Schelling 1980; Thaler and Shefrin 1981; Elster 1984). The problem is one of self-management. The child-abusing mother, when remorseful, may vow that she will remain sober, yet on another day her attraction to alcohol will overcome her determination to imple-

ment this vow, and the cycle will begin again. The set of preferences that stresses instant gratification and leads to self-destructive behavior must be kept in check in order for the more "adult" set of preferences to have sway.

Schelling (1980) noted that the ability to self-manage successfully is not just a matter of willpower but a skill that can be acquired. Self-help groups such as Alcoholics Anonymous (AA) offer interpersonal rewards for remaining sober but also seek to teach techniques on how to manage; AA members are instructed that abstinence is the only feasible goal given their inability to manage moderate drinking, and that they should approach the problem of achieving abstinence one day at a time.

The difficulty in implementing a vow of sobriety depends not just on the individual, but also on his or her environment. An environment in which alcohol is readily available at low prices, and drinking is encouraged through advertising and social pressure, is likely to undercut willpower and management technique. Public policy thus plays a role in the self-management problem; the temptation to abuse alcohol will be muted by higher taxes, reduced availability, and less promotion and advertising. For some people the result may be more prudent decisions and a greater ability to avoid becoming either a victim or perpetrator of violence.

Notice that this account provides one answer to those who reject the proposition that moderate changes in alcohol availability will matter for someone who is caught up in a cycle of drink-

ing and violence. Intuitively it seems that such people are already suffering high costs for their drinking; an increase in the beer excise tax would seemingly represent a minor and inconsequential addition to this cost. The answer to this objection is that the cost imposed by a tax increase is qualitatively different than the cost imposed by the consequences of violence. The price of alcohol is paid at (or before) the time the drinks are consumed. For those who are not struggling to control their alcohol abuse, the higher price may matter simply because they will not be able to afford to drink as much or get drunk so often. For those who foresee the violent consequences of their alcohol abuse, higher prices may reduce the temptation to drink heavily and provide support for maintaining sobriety.

Our discussion can be summarized as follows:

- Much alcohol-related violence is not random or mindless, but rather can be characterized as instrumental;
- Within a rational-decision framework, drinking may engender violence by changing either the actual consequences or the subjective valuation of the consequences of engaging in or provoking violence;
- This framework can be usefully expanded to take account of self-management problems; and
- It is plausible that moderate restrictions on the availability of alcohol may reduce alcohol-related violence.

ALCOHOL CONTROL MEASURES AND VIOLENCE

These speculations concerning the causal links between alcohol and violence encourage us to seek evidence on the relationship between alcohol availability and violence rates. This section reviews existing findings and discusses quasi-experimental methods for learning more about this phenomenon.

Review of Existing Findings

Jeffrey Fagan (1990) provided a concise summary of the evidence on the association between drinking and violence:

Alcohol use has been associated with assaultive and sex-related crimes, serious youth crime, family violence toward both spouses and children, being both a homicide victim and perpetrator, and persistent aggression as an adult. Alcohol "problems" occur disproportionately among both juveniles and adults who report violent behaviors. (p. 242)

The link between alcohol and violence is remarkably strong. In perhaps the best study of its kind, Smith et al. (1989) reported that during the period 1973–83, fully 64 percent of the homicide victims age 15 and over in North Carolina had been drinking at the time they were assaulted.⁵ A number of studies have found that the perpetrators as well as the victims of violence are likely to be heavy drinkers and to be under the influence when engaging in violent acts (Wolfgang

1967; Coleman and Straus 1983; Kalish 1983). But statistical association does not by itself demonstrate direct causation.

The statement "drinking causes violence" can be given meaning by way of a thought experiment.⁶ We can imagine staging a particular sort of encounter between two or more people a number of times, with random assignment to a "drinking" or "no drinking" condition for the participants. If the probability that the encounter results in violence is found to be higher under the drinking condition, that constitutes evidence in support of the assertion that "drinking causes violence" for the given circumstance. Of course, the answer may differ depending on the nature of the encounter and the amount of alcohol consumed.

Furthermore, this experiment does not allow for the possibility that "drinking causes violence" by changing the frequency with which certain especially risky encounters occur. Routine activities that determine the amount of exposure to dangerous circumstances may be influenced by drinking patterns, as in the case of bar hopping on a Saturday night (Parker 1992). As a result, it is relevant to specify a different thought experiment in which the community rather than the individual (or small group) is the unit of account. We could imagine subjecting a number of communities to a wide range of levels of

alcohol availability on a controlled experimental basis, with careful measures of overall violence levels measured for each condition.

The observed statistical associations between drinking and violence are for the most part based on natural, rather than experimentally controlled, variation. As a result the proper interpretation is in some doubt (Pernanen 1981; Collins 1989). First is the possibility of reverse causation. The decision to engage in violent acts may "cause" drinking, in the sense of providing an excuse, or providing courage (Cordilia 1985). More generally, for a number of obvious reasons criminal lifestyle may engender heavy drinking (Roizen and Schneberk, 1977). Second is the possibility that drinking and a propensity to violence may both stem from a common cause and are hence associated with each other even though they have no direct causal connection. The common cause may be a risk-seeking personality or social environment that encourages deviant behavior.⁷ And third, the association may simply be spurious; it is known for example that violent criminals who drink heavily are more likely to be caught and hence will be overrepresented in samples of convicts or inmates (Petersilia et al. 1978; Collins 1986).

These plausible explanations for the association between drinking and violence

⁵Fifty-three percent had blood alcohol concentrations (BAC's) in excess of 0.1 percent, the standard used in North Carolina in defining driving under the influence. It should be noted that the authors excluded from their statistics all cases in which death came more than 4 hours after the attack, since a blood sample taken long after the attack would not provide an accurate measure of BAC at the relevant point in time.

⁶See Manski et al. (1992) for a formal discussion of the meaning of causation in natural data.

⁷Collins (1986) noted the correspondence between crime, alcohol abuse, and demographic characteristics. Young men have relatively high rates of abusive drinking and involvement in violent crime.

undermine confidence in the importance of drinking as a direct cause of violence. James Collins (1989) made this point in the title of one of his reviews: "Alcohol and Interpersonal Violence: Less Than Meets the Eye." The fundamental question here, as explained above, is whether an intervention that reduced the prevalence of drinking or alcohol abuse would thereby reduce the level of crime. This question suggests the study of instances from the real world that approximate the ideal experimental intervention. As Room (1983) noted, "Aggregate-level studies of temporal changes are probably the strongest existing evidence of the potential importance of alcohol consumption in explaining crime—and are certainly of interest from a policy perspective" (p. 41).

Room reviewed results from several natural experiments in Scandinavia, including the Finnish liberalization of beer sales in 1969 (Mäkelä et al. 1981) and the strike in the Finnish alcohol monopoly stores in 1972 (Mäkelä 1980). In each case there was a substantial change in reports of interpersonal violence in the expected direction.⁸ The techniques for assessing these natural experiments can be illustrated by a more detailed look at one of them, based on the writeup in Hauge (1988), which we summarize here.

In September 1978, workers at Norway's State-operated Wine and Spirits Monopoly began a strike lasting 9 weeks, thereby stopping deliveries of wine and spirits to the monopoly's retail outlets and to licensed premises. Within 4 weeks sales

of these beverages had ceased. Beer sales increased, as did moonshining and cross-border purchases in Sweden, but nonetheless there was a decrease in alcohol consumption amounting to between 20 and 30 percent. A comparison of the 5 weeks of the strike when alcohol consumption was at its low with the same period the preceding year found a 22-percent reduction in "domestic disturbances," and a 15-percent reduction in acts of violence against the person. These reductions cannot be explained as part of a general downward trend in violence, as Hauge demonstrated by citing crime levels during the 3-week periods before and after the strike. Rates of violence during those periods were actually slightly higher than violence rates during the same periods during the previous year. Thus there is persuasive evidence that the strike caused a reduction in drinking and in rates of recorded violence. The immediate cause of the reduction in drinking was the strike; it is not plausible that the strike would have reduced violence directly, so we conclude with considerable confidence that it was the reduction in drinking that was the immediate cause of the reduction in violence.

While such evidence is persuasive, it is primarily drawn from a rather narrow set of circumstances: temporary interruptions in availability occurring in Scandinavian countries. It will be of considerable interest to determine if longer term interventions such as changes in the legal drinking age or alcohol excise taxes,

⁸For other examples see Lenke (1982) and Wald and Moskalewicz (1984).

occurring in the United States, also produce evidence of reductions in violence. Remaining doubts about the importance of alcohol as a cause of violence may be dispelled by such evidence.

Methods

In recent years there has emerged an increasingly active research program concerned with producing econometric estimates of the causal effects of alcohol control measures on policy-relevant outcomes, including youthful drinking, heavy drinking, traffic fatalities, and cirrhosis mortality (Grossman, in press). This list of outcome variables could easily be extended to include measures of violence; the same econometric methods are appropriate.⁹

The basic approach can be illustrated by a summary of Saffer and Grossman's (1987a) article "Beer Taxes, the Legal Drinking Age, and Youth Motor Vehicle Fatalities." Their data set consisted of annual observations for each of the 48 contiguous States for the years 1975–81. Three outcome measures were utilized: traffic accident mortality rates for youths aged 15 to 17, youths aged 18 through 20, and youths aged 21 through 24. The explanatory variables in their analysis included two State policy variables that were the main focus of this study: the State excise tax on beer and the legal drinking age for beer. They estimated the effects of these variables on each of the three outcome variables using weighted least squares. The specifications for these regressions included several other control

variables; one set of regressions included dummy variables for each State. Their results indicate that youthful fatalities are quite sensitive to both of the alcohol control measures, tax and legal age.

Exogeneity

One concern in interpreting the results of such studies is with respect to the validity of the basic assumption that the State legislatures have performed a sort of natural experiment in their decisions regarding alcohol control measures. In the case of the legal drinking age, the assumption is that the decision of whether or not to legislate an age change in a State is independent (in a statistical sense) of the youthful fatality rates in that State. As it turns out, there is evidence that States with low youth fatality rates were more likely than others to lower their minimum age during the early 1970's (Cook and Tauchen 1984), and that there was also a relationship of this sort in the period 1975–81 (Saffer and Grossman 1987b). As a result the State cross-section relationship between minimum age and fatality rates reflects causation in both directions.

With time-series data on a cross-section of States or other geographic units, a more reliable approach is available. A regression analysis of panel data on States can account for all the variables that influence the cross-section structure of State fatality rates without actually specifying or measuring these variables. The technique is to include "fixed effects" of States in the form of an array of dummy vari-

⁹Chaloupka and Saffer (1992) have begun this work.

ables, one for each State. Once these stable effects are taken into account, what remains (in a statistical sense) is the variation over time in the minimum drinking age and youth fatality rates. Only within-State *changes* in the relevant variables, rather than their levels in any one year, are included in the estimation of the "treatment" effects. Using this approach the estimate of the effect of the minimum age variable on traffic fatalities will be valid so long as legislatures are not influenced by trends in youth fatality rates.¹⁰

A related issue concerns changes in other laws or policies that may affect the outcome measure. If for example there was a tendency for State legislators to change other drunk-driving legislation in the same year as they change the minimum age, then it would be necessary to explicitly control for other policies in estimating the minimum age effect. The econometric feasibility of this approach is demonstrated in Chaloupka et al. (1991).

Data

To replicate the type of study discussed above utilizing violence indicators, it is necessary to identify suitable data. The Federal Bureau of Investigation (FBI) Uniform Crime Reports provide data on city and State aggregates for both arrests and crimes reported to the police. The relevant crimes are homicide, assault, rape, and robbery. The Vital Statistics

provides an alternative source of data on homicides.

As in the case of motor vehicle accidents, the most detailed and reliable data available on the incidence of violent crime are for those crimes in which the victim dies. But the routinely available homicide data are not as detailed or as complete as the Department of Transportation's Fatal Accident Reporting System (FARS) data for traffic fatalities. The most important difference is that FARS has data on most drivers involved in fatal crashes, whether or not these drivers died in the crash; the FBI's Supplementary Homicide Reports (SHRs) only include data on the killer when the police have a suspect at the time. Another difference is that the SHR data, unlike the FARS data, include no information on drinking by either the killer or the victim.

The econometric literature on drinking and driving includes a variety of outcome measures. For example, Chaloupka et al. (1991) analyzed the total fatality rate, the nighttime driver fatality rate (for accidents occurring between midnight and 4 a.m.), and the alcohol-involved driver fatality rate (estimated from FARS data). The advantage of the narrower measures is that they are presumably more sensitive to the intervention; for example, since most of the nighttime fatalities involve drinking, we expect that there would be a larger proportional change in this rate than in the overall rate in response to a change in alcohol

¹⁰Some social scientists have utilized interrupted time-series methods to measure the effect of specific changes in alcohol control laws. Most notable is the work of Alex Wagenaar (1983) on the effects of changes in legal drinking age. Hingson et al. (1985) provided a simple before-and-after analysis of the effects of an increase in the Massachusetts minimum drinking age on youth mortality rates, including nontraffic accidents, suicide, and homicide, but found that the data do not support any clearcut conclusions.

availability. The statistical advantage to working with a sensitive measure is that if an effect exists, it will be easier to detect. On the other hand, narrowly defined measures are less relevant for policy purposes. As part of a policy evaluation, we want to know the effect of the policy change on the overall fatality rate, rather than on just the nighttime fatality rate. Thus there may be a tradeoff in the choice of outcome measure between statistical sensitivity and policy relevance.¹¹

SOME NEW RESULTS ON VIOLENT CRIME, DRINKING, AND ALCOHOL AVAILABILITY

To illustrate the method described in the previous section, we analyze the effect of beer excise taxes on rates of criminal violence. Table 1 defines the key variables and their sample characteristics. We employ these data to generate three sets of closely related estimates. The first of these is a recursive formulation, with separate equations for crime and drinking. The equations take the following form:

$$\text{Crime}_{st} = \alpha_0 + \alpha_1 \text{Alcohol}_{st} + \alpha_s + \alpha_t + \epsilon_{st} \quad (1)$$

and

$$\text{Alcohol}_{st} = \beta_0 + \beta_1 \text{Tax}_{st} + \beta_s + \beta_t + u_{st} \quad (2)$$

where the subscripts s and t denote the State and year. In the crime equations, α_s represents a set of State dummy variables, which control for all the unobserved persistent State-specific determinants of crime rates, including the socioeconomic and demographic characteristics of the State population, and α_t represents a set of year dummy variables. The coefficients β_s and β_t represent analogous effects in the drinking equation.¹²

Note that if we were to omit the State dummy variables α_s and β_s and estimate the models

$$\text{Crime}_{st} = \alpha_0' + \alpha_1 \text{Alcohol}_{st} + \alpha_t' + \epsilon_{st}' \quad (1a)$$

and

$$\text{Alcohol}_{st} = \beta_0' + \beta_1 \text{Tax}_{st} + \beta_t' + u_{st}' \quad (2a)$$

where $\epsilon_{st}' = \alpha_s + \epsilon_{st}$ and $u_{st}' = \beta_s + u_{st}$, then estimates of the parameters α_1 and β_1 would be suspect, due to possible correlations between the State-specific effects (α_s and β_s) and the variables Alcohol_{st} and Tax_{st} . In equation 2, the parameter β_s acts as a proxy for all time-invariant, State-specific effects, such as climate. If States with warm climates tended also to have high tax rates, the variable Tax_{st} would be correlated with the error term u_{st}' , which contains the State-specific effects β_s , and

¹¹In studying criminal homicide, it may be possible to define alternative outcome measures that are more sensitive to alcohol-related interventions (Parker 1992). For example, homicides occurring on weekends are more likely to involve drinking than homicides on weekdays (Smith et al. 1989). A weekend homicide rate could be constructed from the SHR data for cities and States.

¹²The dummy variables representing years in the two equations capture nationwide trends. Including these dummies is equivalent to entering all variables in the form of differences from the annual average of the States. What remains, then, is the unique State-specific variation in drinking, taxes, and crime.

least-squares estimates of β_1 would be biased. In particular, the estimated value of β_1 would measure the combined effects of taxes and climate. Hence we utilize the model with a complete set of State and year dummy variables, as described by equations 1 and 2.

The dependent variables in the crime equations include the annual rates of murders, burglaries, rapes, and assaults for each State.¹³ The explanatory variables include the annual apparent alcohol consumption per capita, together with time and State dummy variables for the unobserved fixed effects. In equation 2, the beer tax (adjusted for inflation and converted to natural logarithms) is used as a regressor, along with State and year dummy variables.

The second econometric model we consider is a reduced form equation, which results from substituting the right-hand side of equation 2 for the alcohol consumption variable in equation 1. This reduced form equation is similar to those estimated by Cook and Tauchen (1982) in their study of liquor taxes and cirrhosis mortality, and by Cook and Moore (in press) in our study of the effects of beer taxes on schooling. The advantage of the reduced form approach is that it avoids problems of simultaneous causation between alcohol consumption and crime, relying instead on direct estimates of the effect of taxes on crime to simulate the

policy experiment. The estimating equation in this case is given by equation 3.

$$\text{Crime}_{st} = \gamma_0 + \gamma_1 \text{Tax}_{st} + \gamma_s + \gamma_t + v_{st} \quad (3)$$

In estimating all of the equations, we convert the crime, consumption, and tax variables to natural logarithms. In addition to being a more plausible functional form in many respects, this specification helps control for heteroskedasticity and yields direct estimates of the relevant elasticities.¹⁴

Data

Our sample consisted of annual observations on the contiguous 48 States for the period 1979–88, producing an overall sample size of 480. Annual rates of homicide, rape, robbery, and assault were taken from the FBI's Uniform Crime Reports. The State excise tax on beer (per case of twenty-four 12-ounce cans) was adjusted for inflation using the Consumer Price Index for food and beverages, and all tax rates are expressed in 1982 price levels. Data on the annual per capita consumption of alcohol (from beer, wine, and distilled spirits) is based on sales data. Table 1 provides summary statistics and more information on sources.

Nominal tax changes were imposed 34 times during our sample period in 23 different States. Tax changes in our sample ranged from a reduction of 18 cents

¹³We will continue to discuss the model variables in terms of their levels. For estimation purposes, all variables are within-State deviations of natural logarithms.

¹⁴We also explored the possibility that the within-State error term was autocorrelated for some States, which would indicate the presence of time-varying State-specific effects. The null hypothesis of no autocorrelation cannot be rejected at the 5-percent level for 44 of the 48 States.

TABLE I

Variable Definitions and Sample Characteristics, 48 States, 1979-87 Means (Standard Deviations)

Variable name	1979-87	1987 only	Definition*
Murder	7.04 ± 3.86	6.42 ± 3.20	Crime variable: State/year specific murders per 100,000 population
Rape	31.29 ± 12.74	33.46 ± 13.179	Crime variable: State/year specific rapes per 100,000 population
Assault	252.52 ± 121.76	272.98 ± 136.95	Crime variable: State/year specific assaults per 100,000 population
Robbery	143.90 ± 112.02	135.79 ± 104.71	Crime variable: State/year specific robberies per 100,000 population
Alcohol	2.67 ± 0.70	2.52 ± 0.62	Apparent state per capita ethanol consumption in gallons
Tax	0.47 ± 0.45	0.44 ± 0.40	State beer tax on a case of 24 12-ounce cans of beer, 1982 prices

*The crime, alcohol consumption, and tax variables are all converted to natural logarithms for estimation purposes.

Data Sources: Crime rates are from Statistical Abstract of the United States, U.S. Department of Commerce, various years. Alcohol consumption is from National Institute on Alcohol Abuse and Alcoholism, "Apparent Per Capita Alcohol Consumption: National, State, and Regional Trends, 1977-1989." Beer tax data are from the Brewer's Almanac.

per case (in Ohio in 1982) up to an increase of 27 cents per case (Alabama 1983). To account for the fact that the nominal tax changes occurred at different times during the year, the average tax levels were computed for each year, weighted according to when the tax was changed. For example, the tax in Arizona was doubled from 18 cents to 36 cents per gallon on July 1, 1984. The tax levels used for Arizona in the years 1983, 1984, and 1985 equal 18, 27, and 36 cents.

Results

Table 2 presents the results of our analysis. The first row of the table presents the esti-

mates of the key coefficients from the four estimated versions of equation 1, where the log of each crime variable is regressed on the log of the alcohol consumption variable, and on State and year dummy variables. The second row presents the estimate of equation 2, where the log of alcohol consumption is regressed on the log of the real beer tax and the State and year dummies. The third row presents the estimates of equation 3.

The results in row 1 indicate that intertemporal variations in alcohol consumption and violent crime are closely related. In each equation, except for murder, the estimated effect of alcohol con-

sumption is positive and significant at very stringent confidence levels.

The alcohol elasticity of the rape rate with respect to a change in per capita alcohol consumption equals 0.674; a 10-percent increase in alcohol consumption will lead to a 6.74-percent increase in the incidence of rapes. This coefficient is fairly precisely estimated: a 95-percent confidence interval for the elasticity estimate ranges from 0.32 to 1.03. A 10-percent increase in alcohol consumption will increase the rates of murder, assault, and robbery by 0.9 percent, 5.9 percent, and 9.1 percent, respectively. The estimated murder effect is substantially smaller than the other effects, for unknown reasons. The 95-percent confidence intervals are as

follows: for the alcohol-murder elasticity, (-0.43, 0.60); for assault, (0.20, 0.97); and for robbery, (0.57, 1.28).

Table 2 also reports our estimate of the key coefficient from the alcohol consumption equation. As indicated (equation 2), an increase in the beer excise tax is associated with a significant reduction in alcohol consumption. In particular, a 10-percent increase in the beer tax per case reduces alcohol consumption by 0.48 percent per capita.

Equation 3 relates the beer tax directly to violent crime rates. As shown in table 2, the four key coefficients (from the four relevant regressions) are all negative, and two are statistically significant. Given the results of equation 1, we did not expect

TABLE 2

Crime, Alcohol Consumption, and Taxes
Fixed Effect Estimates (OLS)

	Alcohol consumption	Murder	Rape	Assault	Robbery
Equation 1					
Alcohol consumption	---	0.087 ± 0.261	0.674* ± 0.180	0.585* ± 0.192	0.913* ± 0.182
Equation 2					
Real beer tax	-0.048* ± 0.014				
Equation 3					
Real beer tax	---	-0.032 ± 0.070	-0.132* ± 0.048	-0.026 ± 0.052	-0.087† ± 0.050

The crime, alcohol consumption, and tax variables are converted to natural logarithms for estimation purposes. State and time dummy variables are also included as regressors in each equation. Each cell value represents a coefficient from a single regression equation. Sample size = 432.

* Statistically significant, 0.01 confidence level, one-tailed test.

† Statistically significant, 0.05 confidence level, one-tailed test.

Data Sources: Crime rates are from Statistical Abstract of the United States, U.S. Department of Commerce, various years. Alcohol consumption is from National Institute on Alcohol Abuse and Alcoholism, "Apparent Per Capita Alcohol Consumption: National, State, and Regional Trends, 1977-1989." Beer tax data are from the Brewer's Almanac.

that the beer tax would affect the homicide rate, but the lack of a clear result for assault is an unexplained surprise.

What do these results imply about the effectiveness of beer taxes in controlling violent crime? There are two ways to estimate the relevant effects. First, we can combine the estimate of the effect of the beer tax on alcohol consumption (from equation 2) with the estimates of alcohol consumption on various crime rates (from equation 1). Alternatively, we can use the estimates from equation 3 directly. The latter approach is preferred in the sense that it is utilizing the most directly relevant evidence. The other estimates, based on combining equations 1 and 2, appear to offer stronger support for the importance of beer taxes, but this approach is only valid under certain assumptions that are not tested here.¹⁵ Since the estimated coefficients represent elasticities, the results from equation 3 imply that a 10-percent increase in the beer tax will reduce murder by 0.3 percent, rapes by 1.32 percent, assaults by 0.3 percent, and robbery by 0.9 percent.

THE SOCIAL COSTS OF ALCOHOL-RELATED VIOLENCE

Calculating the social value of interventions that are effective in reducing violence rates requires an accounting framework. The "consensus" framework for policy work was developed by a Public

Health Service task force chaired by Dorothy Rice (Hodgson and Meiners 1979). This framework has been utilized in two recent studies of the total national costs of alcohol abuse (Harwood et al. 1984; Rice et al. 1990). The framework and its application to alcohol abuse have been attacked by economists for being insufficiently grounded in economic theory and for the shortcomings of the empirical work (Heien and Pittman 1989). Our main concern here will be with respect to the clash with economic theory.

Economists define "cost" as synonymous with "opportunity cost," which is the value of opportunity foregone by choosing one option over another. Thus the "total" cost of alcohol abuse can be interpreted as the collective gain associated with an intervention that eliminates alcohol abuse completely. Of course, no such intervention is available in reality, and real-world interventions that reduce alcohol abuse have a variety of effects on health-related behaviors and other consequences. If it is not possible to define a choice even in theory that would eliminate alcohol abuse without other problematic consequences, then the "total cost" of alcohol abuse has no operational meaning. A number of economists (Myrdal 1930; Österberg 1983; DiNardo 1992) have suggested that it would make more sense to estimate the costs and benefits of specific real-world interventions,

¹⁵While generally speaking, a reduction in per capita drinking reduces violent crime (as shown in equation 1), and an increase in the beer tax reduces per capita consumption (equation 2), there remains a logical possibility that an increase in the beer tax would not reduce violent crime rates. For example, perhaps the groups that are particularly sensitive to the price of beer are not those who tend to become involved in violent encounters. Based on the results in equation 3 this logical possibility can be ruled out with some confidence for the crimes of rape and robbery, but not for assault.

rather than the imaginary, perfectly effective intervention that underlies the estimates of "total" costs. Knowing the intervention helps guide the evaluators in deciding which causal mechanisms to explore and which to ignore.

A second challenge is also fundamental to the enterprise. It concerns the distinction between costs borne by the drinker (in the current example) and costs caused by the drinker but borne by others. This distinction is important in normative economic theory but is not made in the cost-of-illness studies, or, for that matter, in other types of public health evaluation research. As Dan Beauchamp (1980) noted in his discussion of the ethic of public health,

The question of public health here is not the distribution of specific benefits to identifiable individuals, but rather the improvements of levels or rates of health among the entire population or among specific groups...[P]ublic health stands closer to a communitarian ethic than does the stark individualistic perspective of most treatments of social justice. (p. 158)

The distinction can be illustrated by an example, which is constructed so as to make the point as sharply as possible. Consider two hypothetical scenarios. In the first, every millionth drink contains poison that kills the drinker. In the second scenario, every millionth drink contains poison that causes the drinker to fly

into a murderous rage and kill someone at random. In both cases the death rate is proportional to alcohol consumption. Assuming that drinkers know these facts, do they present equally strong cases for government intervention to reduce drinking? The cost-of-illness framework would not distinguish between them, but the standard normative framework of economics would assert that there is an important difference. In the first scenario, the victims are the losers in a lottery that they voluntarily chose to play. Ex ante their behavior indicated that for them the benefits of drinking exceeded the cost. Given the tenets of consumer sovereignty, there is no case here for government intervention to reduce drinking. In the second scenario, the victims are "innocent" in the sense that they did not accept the risk voluntarily. This risk is a negative externality of drinking and becomes grounds for government intervention to restrict alcohol consumption. This distinction is made in the recent assessment of alcohol-related costs by Willard Manning et al. (1991), who asserted that the only traffic fatalities that "count" as relevant to alcohol control policy are those in which a sober occupant is killed in a crash with a drunk driver—only about one-third of all alcohol-related traffic fatalities.

More than a few readers may accept the normative relevance of the distinction between voluntary and involuntary risks but question its application in particular circumstances. For example, we may question whether an alcoholic who becomes easy prey to muggers when in an

alcoholic stupor is acting "voluntarily." Yet in a variety of other circumstances, beginning with child abuse, the classification between voluntary and involuntary is not so difficult.

Is alcohol-related violence more like the first or second scenario in our example? PERNANEN (1991) suggested that in the public perception the first is a better fit:

[V]ictims of violence in alcohol use contexts seem more closely selected on morally relevant criteria than are, for example, victims of drunken driving. High-risk situations for violence are generally perceived as containing mostly people who know full well about the context and its inherent risks. They often drink themselves. (p. 6)

This perception may account for the rather strange lack of public (and scientific) interest in the alcohol-violence link. But as far as we know it has no grounding in fact. The comparison with traffic fatalities would be of interest, if it were possible, since in recent years there has been consensus that drunk driving is a serious matter that provides a rationale for higher age limits and other restrictions on alcohol availability. Yet in only about one-third of fatal drunk-driving accidents is someone other than the drinker or his passenger killed (Manning et al. 1991). The analogous statistic for alcohol-related violence cannot be estimated accurately due to the difficulty in ascertaining the drinking status of the assailant in many fatal assaults.

We offer two conclusions. First, ascertaining social costs (for alcohol-related violence or anything else) is not just a matter of assembling some statistics and adding them up. Prior to gathering data is the task of establishing an accounting framework that defines what is to be counted in the calculation. Good practice requires that this framework be made explicit and be applied consistently. Our second conclusion concerns one fundamental issue that must be addressed in developing this framework—whether the distinction between voluntary and involuntary risk is relevant in ascertaining social costs. While scholars working in the public health tradition largely reject the policy relevance of this distinction, economists tend to see it as valid and important. And it is surely important in the public debate over the appropriate regulation of alcohol. The prudent analyst may be well advised to report the results using two alternative accounting frameworks, one that incorporates harms resulting from voluntary risks and one that eliminates them from consideration.¹⁶

RESEARCH AGENDA

The underlying issue in setting a research agenda in alcohol and violence is whether drinking may be credibly considered an important cause of violence. As discussed here and elsewhere in this volume, many researchers have put forward explanations for the close link between drinking and violence that deny the causal interpretation, suggesting instead that the cooccurrence of inebriation and violence results from the influence of "third" causes that

operate on both. But while that interpretation is interesting and receives some support from the evidence, it is not the whole story. Evidence from natural experiments—i.e., abrupt changes in alcohol availability—suggests that drinking does indeed cause violence: Under some circumstances, there is a higher likelihood that an interaction will result in violence if one or more of the people involved have been drinking. We submit, then, that it should be a high priority for the allocation of scarce research funds to develop a better understanding of this causal relationship and what it entails for defining effective prevention strategies.

During the 1980's economists and other social scientists provided persuasive evidence of the importance of alcohol availability as a determinant of alcohol abuse, traffic fatalities, cirrhosis mortality, and other socially costly consequences of drinking. The evidence stems from analysis of how changes in relevant laws and regulations of alcohol relate to changes in aggregate statistical indicators, such as the annual State-level traffic fatality rates. This same approach can be utilized to assess the effects of alcohol availability on rates of violent crime. The results reported here are a modest beginning. We find that per capita consumption influences

violent crime rates. Our analysis of how beer taxes affect violence rates provides evidence that higher taxes reduce robberies and rapes. Further research with more refined measures of violent crime and a more complete characterization of alcohol availability is needed. The results are relevant not only to the immediate matter of measuring the social benefits of regulating alcohol availability, but also to the underlying issue of the causal role of drinking in violent crime.

A complete analysis of these matters requires more than the measurement of aggregate effects. Even if we can reduce violent crime rates by a few percentage points by raising taxes or otherwise restricting availability, there remains the question of whether it is in the public interest to do so. The balancing of interests in such matters must of course be done in the political arena, but analysts may make a contribution by defining and measuring these interests. Of arguable importance in the area of violence is whether the victims are in some sense culpable. Someone who goes to a bar on Saturday nights looking for a fight may well end up recorded in the police statistics as an assault victim, but the public may not have much interest in paying a higher tax on beer for his sake. In the

¹⁶An example from outside the violence area may be instructive. In a general assessment of the benefits of alcohol control measures, how should we account for the costs of hangovers? Surely the total payment that heavy drinkers would be willing to make for an effective cure for hangovers runs into the billions of dollars every year, over and beyond the cost of lost work time or loss of productivity. If so, then the pain of hangovers is one of the important costs of alcohol abuse. Yet this cost is ignored in every calculation we have seen on the subject. The logic of the public health stance on this issue would require that hangover pain be included in the calculation. Economists on the other hand would say that this cost is not relevant in measuring the benefit of alcohol control measures because heavy drinkers are well informed about the risk of hangover and accept that price in making their drinking decisions.

political world as in law and some philosophical frameworks, including the one that dominates in normative economic analysis, reducing involuntary risks has higher priority than reducing voluntary risks. Placing an appropriate social value on the reduction of violence rates may require that such matters be addressed directly, even if it is only to argue that culpability should not be relevant. Progress in measuring alcohol-related costs requires an accounting framework; the tasks of defining, explaining, and making operational this framework are as essential in the research enterprise as the statistical measurement tasks.

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Rational Choice and Pooled Cross-Section Time Series: Theoretical and Methodological Pathways to New Understanding of the Alcohol/Violence Relationship

Robert Nash Parker¹

The preceding paper by Phil Cook and Michael Moore raises a number of interesting issues. In this chapter, I will highlight a few interesting and/or problematic issues noted by Cook and Moore.

Their first point, and perhaps the major contribution of the paper, is to highlight the power or utility of the rational choice perspective (Coleman and Fararo 1992). This perspective has had a checkered history in social science, in part, due to the simplistic way it has been used historically in the social sciences. Cook and Moore's examples aid in dispelling that type of usage. They show the complexity and power of the perspective and its utility.

A number of areas in social science have reexamined the rational choice perspective after at least partial rejection of it. Political science (Brams and Fishburn

1983; Breton and Scott 1978), social psychology (Lawler 1992; Heckathorn 1988), sociology (Coleman and Fararo 1992; Coleman 1990; Friedman and Hechter 1988; Oliver and Marwell 1988; Hechter 1987), and criminology (Piliavin et al. 1986) have benefited from theoretical developments in rational choice.

In particular, and with regard to alcohol-related violence, the power of the perspective is shown in its ability to generate predictions, not all of which, however, will be supported empirically. It is of interest to determine the power of the theoretical model to generate predictions that we would not have generated otherwise (Jasso 1990).

I would like to add two or three predictions to the list given by Cook and Moore. The way alcohol may affect the ability to judge costs and benefits with

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regard to the timeframe in which they occur could, for example, help to explain what many people in society and in scientific circles find to be a puzzle: the failure of capital punishment to deter homicide. Although I do not count myself among those concerned with this puzzle, as there is plenty of scientific evidence and theorizing that can explain this "failure," it is a useful notion that alcohol affects the way one views consequences of acts that occur in different timeframes from the acts themselves. This notion of Cook and Moore's can be applied to the homicide and capital punishment relationship. If capital punishment occurs at all, it occurs in a very distant timeframe from the homicide. If alcohol helps one to discount future consequences of current actions, this particular consequence is one that will be highly discounted under the influence of alcohol.

A second example is the importance of context and the way it affects disadvantaged minorities and racial/ethnic groups in our society. If one lives in a context in which the standard middle class rules—about how one rationally achieves one's goals and how one gets ahead socially and economically given the resources one can marshal—do not make sense, then a set of choices that involve use of alcohol and violence can make sense from a rational choice perspective. The rewards for using alcohol, drugs, and violence may in fact be much higher than the rewards for conforming to legally and socially accepted standards of behavior. For example, Piliavin et al. (1986) examined the rewards as well as the potential risk of punishment perceived by members of

their sample of previously convicted offenders. Respondents were also asked to compare the rewards of illegal activities with those legal activities, such as employment, available to the respondent. Piliavin et al. found that the perceived potential rewards from illegal activities not only outweighed the potential risks, but also outweighed the perceived rewards from legal activities. In such an environment, alcohol or drug use and violence can be seen as yielding much higher rewards than would accrue from abstaining or moderating such behavior. A rational choice perspective highlights how patterns of alcohol or drug use and violence that we see in our inner cities develop, how they are maintained, and how they are reinforced.

A third example concerns the way in which family violence often occurs or continues over a long period of time. If we see a situation in which the lives, the work, and the activities of women are devalued or undervalued in the marketplace, the ultimate rational arena, it may not be surprising that some women would choose to expose themselves to the risk of alcohol-related victimization when their alternative choice exposes them and their children to economic hardship. Again, we can see how the rational choice framework illuminates this causal process and shows us how—in what would seem to be an irrational situation—many victims continue to rationally expose themselves to the potential of violence.

There are many other examples. I am certainly not arguing that the rational choice perspective is the dominant per-

spective or the only one that is useful. However, this perspective does, I believe, generate many useful predictions in terms of both basic research and policy, and therefore it is of great utility.

Another area that Cook and Moore discuss in their paper is the variety of forms that the effects of alcohol on violence could take. It is interesting that one of the forms not discussed in great detail is the interaction effect that alcohol is most likely to have with other factors that affect violence, given the importance of this form of the relationship. Most analysts have rejected the idea of a simple, direct relationship between alcohol and violence (e.g., Pernanen 1991), for the same reason that most researchers studying alcohol and behavior in general have rejected such a simple conceptualization. Namely, individuals behave very differently under similar states of intoxication despite the common biochemical effect alcohol has on humans (see Marshall 1979).

Evidence is given elsewhere in this monograph for the complexity of this relationship and the way different disciplinary perspectives are contributing to our understanding. To approach this relationship, we must theorize about and test hypotheses that involve interactions. For example, alcohol may enhance the impact of poverty on violence, so that in areas with high rates of poverty and consumption, rates of violence are much higher than the additive effects of poverty and consumption would suggest (Parker 1992). This kind of interaction effect of alcohol has also been found with regard to injuries suffered in traffic crashes; victims

who have consumed alcohol suffer more severe injuries, after controlling for the nature of the crash (see Waller et al. 1986).

The use of interactions in sociology has had a negative connotation. There was a computer program called the "Automatic Interaction Detector" that was very popular in the 1960's and early 1970's with which one was supposed to be able to detect all sorts of "unanticipated" interactions. However, the approach was discovered to be conceptually and methodologically flawed, so that the whole notion of testing for interactions became a joke with which to entertain entry-level graduate methods classes. I believe it would be a major mistake to reject entirely the power of interactions and the ability that their use gives us to combine different disciplinary perspectives, to understand the different ways in which these perspectives can be combined, and to examine how these combinations affect violence, particularly alcohol-related violence. The experience of the Automatic Interaction Detector shows that we need to think theoretically and conceptually about the way such interactions operate.

My third general point is to support the methodological approach adapted by Cook and Moore, which is a very powerful and useful one for policy research. I would like to elaborate further on their approach. In most discussions, the rubric under which the approach is described is the pooled cross-section time-series model (Stimson 1985; Hannan and Young 1977). This model has a number of advantages that make it particularly useful for policy evaluation.

One of the problems that a policy analyst always faces is that people are interested in whether a new policy is working (or not working) long before there is sufficient scientific evidence with which to evaluate the policy. For example, a State legislature enacts a new statute designed to reduce drunk driving accidents effective the following January 1; by September, the legislature is anxious for conclusions from the analyst about the impact of this law, which may not have been attempted by any other State. The analyst must work with very sparse data for a short period of time in one place.

Unfortunately, a number of analysts have gone ahead in this kind of situation and attempted to determine on the basis of such sparse data whether the intervention is working or not. Pooled cross-section time-series methodology leads us to consider the combination of different States or cross-sections over a number of different time periods, an approach that allows us to increase our degrees of freedom dramatically. Of course, a number of difficulties arise from the statistical consequences of pooling data in this manner. Fortunately we have the benefit of 30 or more years of econometric research on this model to show us how to deal with some of the problems this approach engenders.

In several of the examples of policy experiments or interventions presented by Cook and Moore (e.g., the case of alcohol industry strikes in different countries and different time periods), an even more powerful approach would be to combine data on strikes and alcohol consumption in a number of countries across a broad

period of time and to compare those results with those obtained in one country with one strike. The pooled approach would give us much greater confidence that our results have some generalizability and are not the result of some unique feature in a particular country, a particular time point, or a unique strike. The dangers of making general policy decisions based on anecdotal or unique information are well known to researchers and policy analysts (although perhaps less well known to policymakers), but the combination of a number of pieces of information, both cross-sectionally and over time, can reassure policymakers and citizens that there is a sound basis for an intervention being contemplated.

The preliminary data that Cook and Moore present concerning the impact of increasing the beer tax on homicide rates is a good example of the potential of the pooled approach, but I would caution the reader not to consider their results of any utility. The model Cook and Moore present is misspecified because of a number of important but omitted variables, such as poverty, routine activity, racial composition, regional differences, and deterrence. The dummy variables for time included in their model are unable to account for this misspecification because the relationships between a number of these variables and homicide were changing over the time period Cook and Moore analyzed. (See Land et al. 1990 for empirical evidence on changes and stabilities in homicide's relationship with its causes over time; see Parker 1993 for a theoretical analysis of the relationship

between the causes of homicide and the potential role of alcohol in the causal processes that lead to homicide.) However, this example does demonstrate the potential of this approach, and for that it is very useful.

Finally, I want to comment on Cook and Moore's discussion of the social costs of alcohol and violence. As Cook and Moore state, the question of the costs to society of alcohol-related violence is one that has an important moral dimension that may or may not be amenable to economic analysis and rational choice models. Their discussion of the difficulties of assessing the costs of alcohol-related violence reminded me of the way that people in this country viewed drunk driving 20 or more years ago. Drunk driving was not viewed as a social problem for the most part, although it is hard to imagine now, given the kind of attention and effort that is currently brought to bear on this problem. There was no organization called Mothers Against Drunk Driving (MADD) or any of its spinoffs. There was no research program or funding, nor were there significant legal or social attempts to do anything about drunk driving or its consequences. Drunk driving was considered socially acceptable.

I think it could be demonstrated historically that one of the ways this situation changed was through the activities of researchers, policy analysts, and Government officials directed toward bringing this problem to the public's attention and identifying the risks and social costs. The beginnings of a similar transformation can be seen in the case of

family violence; people are changing the moral equation by identifying the problems and issues and bringing them to the forefront with research, lobbying, and other activities. C. Wright Mills (1959) discussed the way in which private problems can be transformed into public issues; I believe we can begin this transition with regard to alcohol-related violence. By our activities, our research, and our lobbying, we can bring this problem to the forefront. In that way, we can transform the "moral" equation, so as to allow for the resolution of some of the difficult philosophical issues in estimating the costs of this problem.

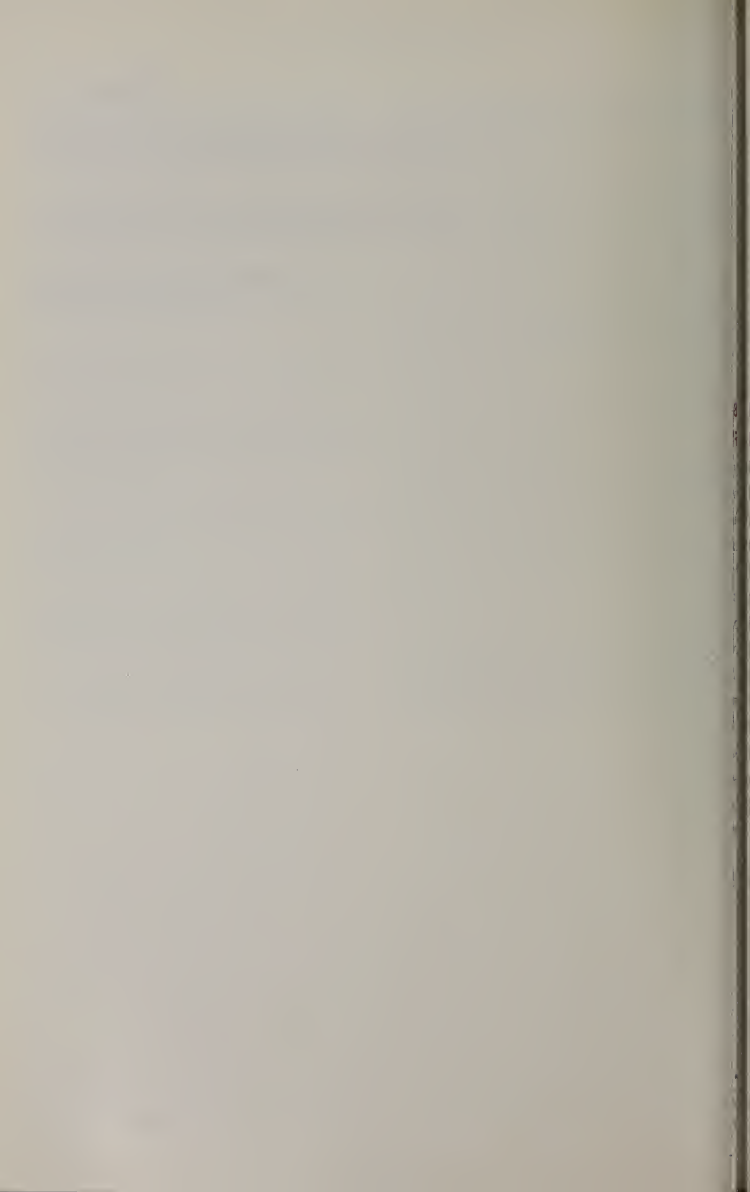
Such efforts will make it easier to recognize alcohol-related violence as an important problem, to develop appropriate estimates of its costs, and to weigh alternative policies. This type of transformation ultimately will help us to address and perhaps prevent alcohol-related violence.

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Part 3:
Cross-Cutting Issues
in Multidisciplinary
Perspectives



Drinking and Violence: An Individual Offender Focus

James J. Collins¹

BACKGROUND AND FOCUS OF PAPER

In the last half-century, a large empirical literature on alcohol-related violence has accumulated. In the most recent 25 years, the questions addressed in this literature have been more carefully formulated, and the research design and analytic techniques brought to bear on the questions have become more sophisticated. Nevertheless, theoretical development—that is, systematic understanding of the etiology of alcohol-related violence—has lagged, and knowledge of the individual, situational, social, and cultural characteristics and etiological processes that account for alcohol-related violence is rudimentary.

Most work on alcohol-related violence can be classified into five categories:

- Analyses of the presence of alcohol in violent incidents;
- Studies of the relationship between levels of alcohol consumption and violence in aggregates such as communities;

- Experimental studies of the relationship between drinking and aggression;
- Surveys of individuals' expectations about the likelihood of violence after drinking; and
- Individually focused studies of offenders' drinking or problem drinking patterns and their involvement in violence.

Examples of studies of alcohol in violent incidents are analyses of homicide incidents using police files (e.g., Voss and Hepburn 1968; Wolfgang 1958), toxicologic studies of homicide victims (e.g., Goodman et al. 1986), and analyses of drinking by patients treated in hospital emergency rooms (e.g., Cherpitel 1989). Such studies typically find that substantial percentages of violent offenders and victims of violence were drinking before the violent event. These studies also document common features of alcohol-related violent incidents such as the disproportionate involvement of young adult males

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and the common occurrence of these incidents on weekends.

A relatively small number of studies have analyzed the alcohol-violence relationship by looking at restrictions on alcohol availability or the number of alcohol outlets and the incidence of violent crime (Gerson and Preston 1979; Roncek and Maier 1991). Typically a direct positive relationship is found between alcohol availability and violent crime. Other aggregate-level studies have looked at the effects of interruptions in the availability of alcohol on the level of violence. For example, Olsson and Wikstrom (1982) studied the effects of mandated restrictions of retail alcohol sales on Saturdays in Sweden over several months. During the period of restricted sales, outdoor assault rates declined for all days of the week but especially for Saturday. Indoor assault rates *increased* slightly for Tuesdays, Wednesdays, and Thursdays, but decreased by 18 percent on Saturdays and 12 percent on Sundays.

A number of laboratory studies have focused on alcohol's relationship to aggression. These studies typically involve individual research subjects in alcohol, no alcohol, and placebo conditions and the administration of an electrical shock to a bogus opponent (Lang et al. 1975; Marlatt and Rohsenow 1980; Shuntich and Taylor 1972; Taylor and Gammon 1975). These studies usually have found that both the consumption of alcohol and the belief that alcohol has been consumed are associated with increased aggression as measured by a simulated shock administered to the bogus opponent.

Surveys have typically found that people think alcohol increases the likelihood that drinkers will act aggressively (Brown et al. 1980; Roizen 1983), but it is not clear to what extent that expectation actually results in aggressive behavior. Some studies found that the expectation that aggression will increase after drinking may not be accompanied by a belief that a drinking violent offender is less blameworthy than a sober one (Aramburu and Leigh 1991). Drinking offenders may still be held to standard behavioral and legal norms.

Individually focused offender studies often examine the current or previous drinking patterns of people who have been involved in violent and other crimes. Examples are surveys of jail and prison inmates and surveys of individuals with drinking problems. Typically such studies use samples not representative of the general population.

This paper focuses on individually based research and attempts to synthesize what is known from previous work. Specifically, the paper examines the evidence for a relationship between drinking, problem drinking, and involvement in violence. Lang and Sibrel (1989) argued that the study of individual differences in alcohol-related interpersonal aggression has been neglected even though the most appropriate paradigm for understanding this relationship is one that uses a drinking \times person \times situation interaction model.

To preview our findings, we will conclude that alcohol by itself is *not* a powerful factor in accounting for violence. We argue that it is the acute effects of drinking on individuals that are most relevant in the

alcohol-violence relationship; that certain kinds of drinking patterns are more likely to be associated with violence; and that some individuals, especially those with multiple disorders that include heavy or problem drinking, are at greatest risk of being involved in alcohol-related violence.

OFFENDER DRINKING PATTERNS

According to the 1990 National Household Survey on Drug Abuse (NHSDA), about two-thirds of the U.S. population aged 12 and older that resides in households used alcohol in the year before the survey, and slightly more than half of the household population used alcohol in the month before the survey. Alcohol use rates varied by age, gender, and other factors. Males were more likely to drink than females. Those between ages 18 and 34 were much more likely to drink in the last year and month than those under 18 or those 35 and older. Whites were more likely than blacks and Hispanics to have used alcohol recently (National Institute on Drug Abuse (NIDA) 1991, Tables 7.1, 7.2, 7.3).

Frequent drinking and heavy drinking were less common than simply drinking; 6.4 percent of the household population drank on at least 2 out of 3 days in the last month (NIDA 1991, Table 7.6). Males had higher rates of daily drinking than females, and whites had higher rates than blacks and Hispanics. Those aged 35 and older were more likely than younger age groups to report having drunk alcohol on at least 2 or 3 days in the last month.

Five percent of the U.S. household population in 1990 was classified as heavy

drinkers. Heavy use is defined as drinking five or more drinks per drinking occasion on 5 or more days in the last 30 days. Males were more likely than females to be heavy drinkers, but blacks, whites, and Hispanics did not differ markedly from each other in recent heavy drinking. As with drinking overall, the 18-to-34 age group had the highest heavy drinking rate (NIDA 1991, Table 7.7).

Offenders are much more likely than the household population to drink heavily. The average ounces of ethanol consumed per day by State prison inmates in the year prior to incarceration and the U.S. household population for 1979 were compared. For all ages, 47 percent of the male inmates and 22 percent of the female inmates consumed 1 ounce or more per day. Fourteen percent of the men and 4 percent of the women aged 18 and over in the general population drank at this level (Bureau of Justice Statistics (BJS) 1983). When only those aged 18 to 34 are compared, the findings are very similar.

Miller and Welte (1986) analyzed the alcohol consumption rates for combined national samples of jail and prison inmates surveyed in the late 1970's. The alcohol consumption rates of the youngest inmate category were very high. Offenders aged 21 and younger consumed more than 8 ounces of alcohol *per day* in the year before they were arrested.

Offenders often use illegal drugs in addition to alcohol (Beck 1991; Beck et al. 1988; Innes 1988; Wish and Johnson 1986). Among more than 13,000 males arrested in a number of cities in 1989, 4 of 10 had used alcohol *and* another drug—

19 percent had used both alcohol and cocaine, and 21 percent had used alcohol and some other drug in the 72 hours before arrest—and 19 percent had used alcohol only (Visher 1990, pp. 22–23).

Rates of alcohol disorder are disproportionately high for formally identified offenders. The Epidemiological Catchment Area (ECA) studies of community samples in New Haven, Connecticut; Baltimore, Maryland; and St. Louis, Missouri, found that 19 to 29 percent of males could have been classified as alcohol abusers or alcohol dependent at some time in their lives (Robins et al. 1984). The lifetime alcohol disorder rate for prisoners was 56 percent, about twice as high as the general population rate (Regier et al. 1990). Using the same diagnostic methodology as was used in the ECA studies, a study of North Carolina male prison inmates in 1983 found a lifetime alcohol abuse or dependence rate of 49 percent (Collins et al. 1988). A similar study of Michigan prison inmates showed a lifetime alcohol abuse/dependence rate of 46 percent (Neighbors et al. 1987, p. 64).

It is common for offenders with alcohol problems to have other problems as well. We discuss the cooccurrence of substance abuse and other psychiatric disorders in a later section of this paper.

REPORTED DRINKING AT THE TIME OF OFFENSE

Periodically, BJS sponsors surveys of inmates in correctional facilities. In 1986 a survey of a representative sample of almost 14,000 inmates of State correctional facilities was conducted. The respondents were

mostly adults over 18 years of age. A 1989 survey of 5,675 local jail inmates used a similar data collection methodology. In 1987 a representative sample of 2,621 residents of State-operated *juvenile* institutions was interviewed. Approximately three-quarters of the interviewees in the juvenile institutions were less than 18 years of age; the balance were young adult offenders. Subjects in the three surveys were asked about their alcohol and drug use at the time of the offense that resulted in their incarceration. Table 1 summarizes findings for the three inmate surveys.

About 30 percent to 40 percent of the incarcerated offender groups reported being under the influence of alcohol or alcohol and drugs at the time of the offense—32 percent of the youthful offenders and 37 to 41 percent of the older offenders. Generally, the older offenders were more likely than the younger ones to report the use of alcohol by itself, while the younger offenders were more likely to report the use of both alcohol and drugs. These age differences are substantial in most offense categories. It is not possible to say whether aging is associated with desistance of drug use, or whether the younger generation is more likely than the earlier generations to use both drugs and alcohol.

Of particular interest for present purposes are the patterns of alcohol and drug use by offense type. Specifically, is there evidence that alcohol is more important for violent than for other kinds of offenses? Evidence supporting that theory for the overall comparison of the broad categories of violent and property offenses

TABLE I

Percentage of Incarcerated Offenders Under the Influence of Alcohol or Drugs
and Alcohol at the Time of the Offense

Type of offense	Youth in custody		Jail inmates		State prison inmates	
	Alcohol only	Drugs and alcohol	Alcohol only	Drugs and alcohol	Alcohol only	Drugs and alcohol
All offenses	8.5	23.4	29.2	12.1	18.5	18.1
Violent offenses	8.2	24.2	30.7	16.1	20.1	20.0
Murder	17.3	10.0	49.5	13.7	23.6	19.0
Rape	6.2	24.5	21.1*	21.1*	24.7	25.2
Other sexual assault	8.1	9.3	*	*	20.9	19.6
Robbery	6.8	30.6	18.1	17.3	13.4	21.2
Assault	8.5	25.5	44.3	9.8	24.5	17.9
Property offenses	9.7	23.1	17.9	12.8	17.9	17.9
Burglary	10.4	23.6	20.4	17.5	19.7	20.9
Larceny/theft	11.3	20.2	16.5	9.8	15.7	15.5
Motor vehicle theft	8.6	22.6	13.2	13.0	19.6	17.2
Arson	1.5	19.1	†	†	25.7	24.2
Drug offenses	0.0	24.9	7.3	12.3	5.6	10.8
Possession	0.0	23.4	6.7	16.5	5.7	8.3
Trafficking	0.0	23.2	7.8	8.9	5.7	12.2
Public order offenses	7.2	20.6	54.1	9.6	27.7	11.7
Status offenses	16.5	17.6	N/A	N/A	N/A	N/A

* The Jail Inmate Survey reports findings for rape and other sexual assaults combined.

† No estimate given.

Sources: Beck 1991, table 14; Beck et al. 1988, table 13; and Innes 1988, table 9.

is weak. Among incarcerated youth, 8.2 percent of violent offenders said they were under the influence of alcohol at the time of committing their offense, and 9.7 percent of property offenders reported being under the influence of alcohol. Roughly equal percentages of youthful violent and property offenders said they were under the influence of both drugs and alcohol (24.2 and 23.1 percent, respectively).

Jail and prison inmates incarcerated for violent offenses were more likely than

property offenders to report being under the influence of alcohol or alcohol and drugs at the time of the offense. Evidence of an alcohol/violent offense association is somewhat stronger for the inmates if robbery (a violent *property* offense) is excluded from the violence category. About 40 percent of offenders incarcerated for assault (including homicide) were under the influence of alcohol or alcohol and drugs, as were more than 60 percent of homicide offenders in jail. The analogous

overall percentages for the property offenders were 31 and 36 percent.

An earlier analysis used a stratified random sample of 12,000 inmates in State prisons in 1979 to study alcohol's relationship to offending (BJS 1983). These analyses suggest an interpretation of the findings shown in table 1. The 1979 study examined the alcohol/offense type relationship within the context of the inmates' typical drinking patterns. The notion was that if an offender normally drank as he/she did right before the specified crime, the drinking and offending were unrelated. About half the inmates in this earlier inmate survey had been drinking before the offense. Those accused of rape and assault were most likely to report drinking before the offense, and 40 percent had been very heavy drinkers in the year before they went to prison. Forgery and larceny offenders were least likely to have been drinking (BJS 1983, p. 3). The report argued that, given the inmate's usual drinking pattern, the pattern of drinking before the offense may be "no more than would be expected on any particular day" (BJS 1983, p. 3).

The Drug Use Forecasting (DUF) program of the National Institute of Justice collected self-reports of recent alcohol use from newly arrested persons (13,143 males and 4,610 females) in 21 U.S. cities in 1989 (Visher 1990, pp. 22-23). Fifty-nine percent of the males and 47 percent of the females reported using alcohol in the 72 hours before they were arrested. Individuals arrested for violent, public disorder, and family offenses were most likely to report recent drinking. With the exception of bur-

glars, property offenders were less likely to report drinking in the last 72 hours. Those arrested on burglary charges were as likely as those arrested for sexual assault to report recent alcohol use (60 percent).

Visher (1990, p. 23) also used the DUF data to examine alcohol/drug/arrest charge patterns for five types of arrestees: no use of drugs or alcohol, alcohol use only, use of cocaine and alcohol, use of alcohol and other drugs, and drug use only. Those who used neither drugs nor alcohol and those who used alcohol only were more likely to have been arrested for violent offenses. Drug users and users of both drugs and alcohol were more likely to be arrested for property offenses.

Miller and Welte (1986) combined surveys of BJS jail and prison inmates conducted in 1978 and 1979 to examine patterns of drug and alcohol use and the relationship of these patterns to different kinds of offenses using a multivariate methodology. The total combined sample size was 14,341. The inmates were grouped into four categories based on their alcohol and drug use before their incarceration offense: no alcohol or drug use (40 percent), alcohol use only (31 percent), alcohol and drug use (16 percent), and drug use only (14 percent) (Miller and Welte 1986, p. 171). Some statistically significant findings relevant for present purposes are as follows:

- Use of *both* alcohol and drugs was associated with incarceration for a violent offense;
- Alcohol use only was associated with incarceration for a public order offense;

- Use of both alcohol and drugs before the offense was associated with being white or Native American;
- Females were less likely to be in the alcohol use groups; and
- Offenders in the alcohol and drug use group were the youngest, and offenders in the alcohol-only group were the oldest.

The authors argued that the alcohol and drug use group is of special concern.

To summarize, findings from surveys of inmates and arrestees clearly indicate that substantial proportions of most kinds of offenders have consumed alcohol or alcohol and drugs in the period before offending. The evidence also suggests that violent offenders are more likely than property offenders to drink right before the offense, although these findings are somewhat ambiguous. It may also be that preoffense drinking patterns are not much different from regular drinking patterns, so it is not clear whether and how drinking before offending is etiologically relevant. Use of both drugs and alcohol before offending is common, especially for younger offenders.

ALCOHOL AND VIOLENCE IN GENERAL POPULATION SAMPLES

O'Donnell et al. (1976) looked at the relationship of the extent of alcohol use to self-reported involvement in selected criminal acts in a national sample of 2,500 men who were between ages 20 and 30 in 1974. Alcohol use was graded into six categories, from no use to very heavy use. For most offense categories there was a

direct relationship between extent of alcohol use and the likelihood of reporting involvement in illegal behavior. The only violent offense included in this survey was robbery, and the prevalence of robbery involvement was very low. No one who did not use alcohol reported committing a robbery; 2 percent of those in the heaviest alcohol use group reported involvement in robbery.

Harrison and Gfroerer (1992) examined the alcohol-drug-crime relationship using data collected in 1991 from 32,594 individuals sampled from the U.S. noninstitutionalized civilian population aged 12 years and older. Data were collected as part of the NHSDA funded by NIDA. The survey collected information about alcohol and drug use and involvement in several types of violent and other crime (table 2).

While the rate of involvement in violence was higher for those who drank in the last year and higher still for those who reported being drunk monthly, the addition of illegal drug use to alcohol use makes the rates of involvement in violence markedly higher. When logistic regression models were analyzed to estimate the statistical magnitude of the alcohol-drug-violence relationships, the "drunk monthly" variable was found to be significantly associated with committing a violent act and with being arrested and booked for a violent offense. Variation accounted for by the drunk monthly variable was modest, however.

Pernanen (1991) conducted a study of alcohol in human violence in a single Canadian community. The study included a survey of a representative sample of

TABLE 2

**1991 NHSDA Respondents' Involvement in Violent Crime for
Various Alcohol and Drug Use Combinations**

Violent crime involvement	Alcohol and drug use (past year)				
	No use	Alcohol only	Drunk monthly	Alcohol and cannabis only	Alcohol, cannabis, and cocaine
Committed offense	2.7%	4.8%	6.3%	14.6%	26.1%
Arrested for offense	0.4	0.3	1.3	0.9	3.9

Source: Harrison and Gfroerer 1992, tables 4 and 5.

community members aged 20 and older (1,110 interviews), analysis of police reports, and systematic observations in 28 taverns and bars in the community. Pernanen (1991, pp. 66–73) looked at the relationship of alcohol use to three kinds of violence: witnessing violence, receiving threats, and being the victim of actual violence. Relationships between drinking and violence were found, but they tended to emphasize that the influence of alcohol is complex and outcomes depend on specific interactions. Selected findings are as follows:

- Of the violent crimes in the community, 42 percent involved drinking by assailant, victim, or both adversaries;
- Those who drank once or twice a week were more likely than those who drank more frequently or less frequently to witness violence in the previous year;
- Those who drank three or more times a week were more likely to have been victimized violently in the last year;

- Drinking by assailants did not have a statistically discernible effect on the type of violence they chose (punching, kicking, etc.) or on the injury to the victim; and
- Drinking before violence was primarily a young male activity.

Pernanen's work illustrates that drinking by itself is not a strong predictor of violence. He argued that the patterned cluster of alcohol use, location of use, and the activities of participants and their expectations combined to determine whether violence occurred after drinking (Pernanen 1991, p. 70).

Leonard et al. (1985) conducted a study of alcohol use patterns and aggressive behavior in a community sample of 484 blue-collar white men. Average daily drinking in the preceding month was not associated with a history of either fighting or physical marital aggression. However, pathological patterns of consumption (binges, blackouts, inability to stop drinking, etc.) were associated with both fighting and physical marital conflict. An

alcohol disorder diagnosis within the previous 3 years was also associated with physical marital violence, and the relationship persisted when demographic and other factors were controlled in multivariate analyses.

Kantor and Straus (1989) examined the relationship of substance abuse and wife abuse using data from 2,033 female respondents from a national probability household survey. Multivariate analyses showed a relationship between the husband's drunkenness in the previous year and minor violence against the wife, but no significant relationship of husband's drunkenness to severely abusing the wife. Other factors, including husband's use of marijuana, low family income, and violence in the victim's family of origin, were also associated with both minor and severe violence against the wife.

The findings from representative community samples suggest a modest relationship of drinking and problem drinking to involvement in violence. The literature also suggests that some drinking patterns are more likely to be associated with violence and that nondrinking factors, particularly age and sex, are important as well.

COMORBIDITY: ALCOHOL AND OTHER DISORDERS

Regier and his colleagues (1990) examined comorbidity patterns for the five sites that participated in the ECA studies. Those who had lifetime alcohol disorder diagnoses also had elevated rates for most other disorders. The cooccurrence of antisocial personality disorder (ASPD) with

alcohol and drug disorders is particularly notable. More than 7 of 10 individuals with lifetime alcohol disorders also were classified as having ASPD. This is many times higher than the less than 3 percent in the combined community and institutional samples in the ECA surveys who met the criteria for lifetime ASPD (Regier et al. 1990, p. 2513). Part of the reason for the high comorbidity is that some alcohol and drug disorder symptoms are also symptoms for ASPD. Even when the overlap of symptoms is considered, however, high rates of the cooccurrence of ASPD and substance abuse disorders remain (Abram 1989; Collins et al. 1988).

The cooccurrence of ASPD and other disorders is even more notable in offender populations. About 90 percent of prisoners in the five ECA sites diagnosed with lifetime schizophrenia, bipolar, or ASPD's also satisfied the criteria for an addictive disorder (Regier et al. 1990, pp. 2516-2517). The rates of alcohol disorder comorbidity with these three disorders ranged from 73 percent to 86 percent. Abram and Teplin (1991) examined comorbidities in a sample of male jail detainees and reported similar findings. Individuals diagnosed as having severe mental disorders had very high rates (more than 80 percent) of alcohol abuse/dependence, as well as high prevalences of drug abuse/dependence and ASPD diagnoses.

Collins et al. (1988) examined the cooccurrence of antisocial personality and substance abuse disorders for a sample of 1,149 convicted male felons admitted to North Carolina prisons in 1983.

Diagnoses were based on the Diagnostic Interview Schedule, the same instrument used in the ECA studies. Almost half of the inmates (49.2 percent) were classified with lifetime alcohol abuse/dependence disorders, 15 percent with drug abuse/dependence, and 29 percent with ASPD. More than 9 of 10 of those with ASPD also had substance abuse diagnoses—48 percent with an alcohol but no drug diagnosis, and 23 percent with both alcohol and drug diagnoses. Having both antisocial and substance abuse diagnoses *magnified* ASPD symptomatology. Those with ASPD and a substance abuse disorder had higher scores for involvement in aggression and delinquency/crime.

Abram (1989) examined the relationship of alcohol and other disorders, particularly drug and ASPD's, to violent arrest history for a sample of 728 male jail detainees. Multivariate analyses that controlled for age and race were used to examine the substance abuse/ASPD/violence relationships. Neither an alcohol disorder by itself nor an alcohol disorder in combination with a drug disorder or ASPD was associated with an arrest history for a violent crime. A direct relationship was found between lifetime ASPD and a violent crime arrest history. Abram suggested that it may be drinking immediately prior to an offense rather than an alcohol disorder that is relevant. Research by Collins and Schlenger (1988) also supports the interpretation that drinking before the violence—that is, the “acute” effects of alcohol rather than alcoholism or problem drinking—may account for the association between drinking and violence.

Swanson et al. (1990), using the ECA data for *community* respondents to examine the violence and psychiatric disorder relationship, found high rates of disorders among persons who reported involvement in violent behavior in the preceding year. One-quarter of those with a current (12 month) diagnosis of alcohol abuse/dependence reported at least one violent act in the last year. This percentage was much higher than for those with no disorder diagnosis or for those with anxiety, depressive, and schizophrenic disorders. More than one-third of those with a drug abuse/dependence diagnosis reported being violent in the last year. Those with multiple diagnoses had the highest violence rates.

The Swanson et al. (1990) analysis did not take account of the overlap of the violence self-reports with the alcohol disorder diagnosis. The item “getting into fights while drinking” is used as an indicator of violence and is also an item contributing to the alcohol disorder diagnosis. The authors later reported testing the disorder-violence relationship with the “fights while drinking” indicator excluded from the violence measure; they indicated that the alternative analyses do not affect the basic relationship that those with mental disorders report higher rates of violence in comparison to those without a diagnosis (Swanson and Holzer 1991, p. 954). The authors did not, however, report what effect their analyses had specifically on the alcohol disorder/violence relationship.

Some evidence suggests that the co-occurrence of mood disorders and sub-

stance abuse increases the risk of violence. Two Canadian studies found such a relationship. No differences were found between 87 homicide offenders and 373 offenders never convicted of homicide in Quebec penitentiaries who had only one mental disorder diagnosis. However, major depression associated with alcohol abuse/dependence was more common among the homicide offenders (Cote and Hodgins 1992). Langevin et al. (1987) looked at neurological functioning and psychiatric disorders among 18 men charged with homicide, 21 men facing assault charges, and 16 men charged with nonviolent, nonsex offenses. The men in the two violent offender categories had higher substance abuse scores and were also more likely to experience alcohol- and drug-related mood dysphoria. Other research on the mood disorder/violence relationship has found a direct relationship between the two (Anthony 1968; Bland and Orn 1986; Collins and Bailey 1990; Howells 1982). The Langevin et al. study also found a potentially important difference between the drinkers in the violent and control groups. Half of the drinkers in the violent groups felt paranoid after drinking, compared with 27 percent of the drinkers in the nonviolent group.

In summary, substance abuse disorders commonly cooccur with ASPD and other psychiatric disorders, and at least some comorbidity patterns appear to increase the likelihood of violence among individuals so diagnosed. The small number of studies that have focused on this issue, however, make it impossible to move beyond describing empirical regularities at

this time. Moreover, the diagnoses themselves are each complex phenomena with a variety of symptoms and behavioral manifestations. It is reasonable to think that only certain aspects of the disorders or some symptoms or symptom combinations account for the violence potential of the comorbidities. Attempting to describe more specifically what these patterns and interactions might be is a logical next step. Until the relationships are described in more detail, it will be difficult to interpret the relationships etiologically.

It is clear from the evidence examined here, and from other studies as well, that many people under criminal justice supervision have multiple major problems and are prone to involvement in serious violence. They commonly have problems that are not easy to deal with, especially substance abuse and ASPD.

INTERPRETATION

Evidence from the foregoing person-level analyses of the relationship between alcohol and violence can be summarized by several points:

- There is a statistically significant but relatively weak relationship between individual drinking and the likelihood of involvement in violence;
- The drinking-violence relationship is strongest for young adult males;
- The individual drinking-violence relationship is manifested disproportionately for some drinking patterns; and
- The likelihood of violence after drinking is higher for individuals

with some cooccurring disorders or conditions.

Virtually all of the research that considers the drinking-violence relationship carefully by, for example, examining it in the context of individuals' typical drinking frequency or considering other covariates of violence finds an empirical relationship, but one that only modestly accounts for variation. In the simplest sense, the drinking-violence relationship can be viewed in a risk or exposure framework. As shown earlier, offenders are much more likely than the general population to drink and to drink heavily. So regardless of how drinking is related to the likelihood of violence, individuals who drink a lot can be expected to be more likely to be involved in violence.

The simple risk perspective does not provide insight about the etiology of alcohol-related violence, but it does suggest an etiological focus on the immediate effects of alcohol on the individual and his or her interpersonal interactions. Pernanen (1991), for example, gave alcohol-induced cognitive impairment a central explanatory role in suggesting that the psychopharmacologic effects of alcohol negatively affect the drinker's cognitive processing and interpretation of information. Verbal and behavioral cues of individuals may be missed or misinterpreted, thus increasing chances for misunderstanding, conflict, and violence. Such a focus also requires consideration of situational factors such as the relationship of the parties in an interaction, behavioral norms, and the features of the context of the interaction.

Individual and sociocultural factors are also likely to be relevant etiologically, but a risk/exposure emphasis suggests a focus on more immediate aspects.

The second point above, that young adult males are disproportionately involved in alcohol-related violence, is well established empirically though not well understood. Improvements in understanding may result from consideration of unique aspects of the young adult male lifestyle, including gender- and age-specific behavioral norms and attitudes and the possible relationship of social integration factors. For most individuals, the young adult years are a time of transition between dependent and independent living, school and career, and single and married life. This period during which new lifestyles and commitments are being forged may be a time when societal norms, such as those against heavy drinking and violent behavior, are more likely to be violated.

The third point above is based on those findings that indicate it is not simply drinking frequency that is associated with violence but the pattern of alcohol consumption. Recall Pernanen's (1991) finding that those who drank once or twice a week were more likely to witness violence than those who drank more frequently or less frequently, and Leonard et al.'s (1985) finding that average daily drinking was not associated with violence, but that a pathological pattern of consumption was. The probable relevance of drinking patterns should not be surprising. For example, a person who has one or two drinks a day at home can be expected to have a lower risk

of violence than an individual who drinks 10 or 12 drinks once a week at a public drinking establishment. The relevance of drinking pattern underlines the complexity of the alcohol-violence relationship and the need to collect and analyze data for multiple dimensions of alcohol use.

Finally, evidence from work that focused on multiple disorders such as alcohol and drug use, antisocial personality, and the affective disorders suggests that multiple disorders or the interaction of drinking with other disorders is particularly noteworthy. Some individuals with multiple disorders appear to be at particularly high risk of being involved in violence and other seriously deviant behavior. Future work should attempt to identify the comorbidities, symptoms, and symptom combinations that increase the risk of violent behavior.

CONCLUSION

Understanding violence is a daunting task. The recent National Research Council report *Understanding and Preventing Violence* found a wide range of risk factors for violent behavior (Reiss and Roth 1993, p. 20), citing biological, individual, social, economic, and cultural traits, conditions, and processes. The Council's report concludes that the alcohol-violence connection is complex: "The link among alcohol, other psychoactive drugs, and violence turns out to be not an example of straightforward causation, but rather a network of interacting processes and feedback loops" (Reiss and Roth 1993, p. 183). This assessment is similar to the characterization of Lang and Sibrel (1989)

referred to earlier, that the drinking-violence relationship is best understood by a drinking x person x situation interaction.

Attempts to understand the drinking-violence relationship will require dealing with its complexity, including individual factors such as the patterns of drinking and particular pharmacologic effects that elevate the risk of violence after drinking. Future studies should identify the features of drinking contexts that increase violence risk and explicate alcohol's social and cultural meanings and functions that are also known to have behavioral effects that influence the likelihood of violence.

Understanding the drinking-violence relationship is an analog to the overall understanding of violence. Thus, progress on the drinking-violence question will contribute to general violence understanding. If the etiology of alcohol-related violence is elaborated, especially if the sociocultural groundings for the alcohol-violence relationship can be specified, real progress will have been made in identifying how these social realities generate interpersonal violence.

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The Effect of Co-occurring Disorders on the Relationship Between Alcoholism and Violent Crime: A 3-Year Followup of Male Jail Detainees

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This paper extends some of James Collins' observations concerning comorbidity and its effect on violence (see Collins, this volume). As Collins and others have noted, many researchers have found a link between alcohol use and violent crime (Collins 1981*a,b*, 1989; Greenberg 1981; Pernanen 1976, 1981, 1991; Roizen and Schneberk 1978). However, in most studies of alcohol and violent crime, subjects are treated as if they have only one disorder, alcoholism. This is unfortunate because many persons with alcohol abuse or dependence disorders (hereafter referred to as alcoholism) also have other disorders that may affect their propensity for violence. In this paper, we focus on the two disorders that commonly co-occur with alcoholism—drug abuse/dependence and antisocial personality disorder

(ASPD). We examine whether jail detainees with alcoholism, alone and in combination with drug disorder and ASPD, are at particular risk for committing violent crime after release from jail.

BACKGROUND

It is clear that alcoholism varies along a variety of dimensions (Babor et al. 1992; Collins 1989). As Collins' review (this volume) highlights, one important dimension to delineate is co-occurring psychopathology. The presence of a co-occurring disorder can substantially alter the course of a given syndrome and its impact on an individual's behavior. The manner in which two disorders interact can vary. On the one hand, a codisorder may be completely subsumed under the dominant influence of a primary disorder

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and barely exert any influence. On the other hand, one disorder may potentiate the symptoms of a codisorder. For example, several studies have found that antisocial alcoholics consume more alcohol than nonantisocial alcoholics (e.g., Jaffe and Schuckit 1981; Schuckit et al. 1977). It is possible, then, that the combination of two or more disorders uniquely contributes to, exacerbates, or even obfuscates an apparent criminal propensity.

From a practical standpoint, knowing how disorders interact vis-à-vis violent crime has direct implications concerning strategies for reducing violent crime. It is generally thought that reducing the incidence of a pathological correlate (e.g., drinking) will lead to a reduction of crime. This approach may be too simplistic. There is some evidence that a co-occurring disorder dictates a different intervention strategy than if a disorder occurs alone. McLellan et al. (1981) found that the extent to which treatment for alcoholism reduced crime was determined, in part, by the diagnostic profile of the alcoholic. This suggests that understanding diagnostic interactions will help target the most at-risk groups for intervention and, in so doing, indicate appropriate modes of intervention.

THE PROBLEM

This paper focuses on the impact of co-occurring drug use disorder and ASPD on the relationship between alcohol and violence. These disorders were chosen for three reasons.

(1) *Prevalence.* Although reported rates vary across studies, alcoholism, drug

use disorders, and ASPD are prevalent disorders among offenders (Abram 1989; Collins et al. 1988; Smith and Newman 1990; Wiczorek et al. 1990). Among jail detainee populations, for example, alcohol use disorders ranged from 15 percent (Schuckit et al. 1977) to 26 percent (Petrich 1976a); drug use disorders from 6 percent (Swank and Winer 1976) to 51 percent (Petrich 1976a); and ASPD from 13 percent (Swank and Winer 1976) to 48 percent (Teplin, submitted; also see Guy et al. 1985; Petrich 1976b). By any account, these rates pose a significant problem for the criminal justice system.

(2) *Frequency of co-occurrence.* The tendency for drug use disorder and ASPD to co-occur with alcoholism has been demonstrated among a wide range of samples, including the general population, arrestees, prison inmates, psychiatric emergency room patients and inpatients, and drug and alcohol treatment patients (Abram 1990; Collins et al. 1988; Regier et al. 1990; Robins et al. 1977; Schuckit 1985; Wolf et al. 1988; Woody et al. 1985). Thus, any interaction among the three disorders relative to violent crime is very likely to be exerting a significant influence.

(3) *Correlation with criminal activity.* Alcoholism, drug disorder, and ASPD have been shown to correlate with criminal activity, and often violence. The literature indicates that the pharmacological effects of alcohol, the symbolic connotations of drinking, the interpersonal situation, and sociocultural factors all influence the configuration of the alcohol-crime relationship (Collins, this volume; Pernanen 1981; Roizen 1993). Although many studies

have found a correlation between alcohol and violent crime, methodological problems make it difficult to know if alcohol causes violent crime or is merely a correlate (Lang and Sibrel 1989; Murdoch et al. 1990), and the nature of the link is still unclear (Collins, this volume).

The relationship between drug abuse and crime is also a longstanding finding in the criminological literature (Gandossy et al. 1980; Gropper 1985; Nurco et al. 1985; Wish and Johnson 1986). A substantial proportion of offenders have used or have been addicted to drugs, particularly heroin (Chaiken and Chaiken 1982; Eckerman et al. 1971; Wish et al. 1981). Conversely, a large percentage of drug users have engaged in crimes beyond those relating to controlled substances (Inciardi and Chambers 1972; Johnson et al. 1985; Stephens and Ellis 1975). Still other studies have found that the amount and type of criminality covaries with addiction patterns; drug users commit more crimes when actively using than during periods of abstinence or infrequent use (Ball et al. 1981; Johnson et al. 1985; McGlothlin 1979). Income-generating crime is the most common type of crime perpetrated by drug users (Gandossy et al. 1980).

The relationship between drug use and violent crime is less clear (Gandossy et al. 1980; Goldstein 1985; Johnson et al. 1985; Wish and Johnson 1986). Although drug users commit violent offenses, they engage in fewer violent offenses than do nonusers (Gandossy et al. 1980). Drugs and violence are linked in three ways: pharmacologically, economically, and systemically (Goldstein 1985). Goldstein

suggested that the systemic factor—the social and economic lifestyle of drug users and sellers—rather than the effects of drug use per se, causes the elevated rate of violence among drug users.

ASPD has an obvious and, some have suggested, a tautological relationship with crime (Hart et al. 1988; see, however, Robins 1992). Criminal activity is one of the criteria for the Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III) diagnosis of ASPD. A large portion of prison inmates (Collins and Schlenger 1988; Guze et al. 1969) and jail detainees (Petrich 1976*a,b*; Schuckit et al. 1977; Teplin, submitted) meet criteria for ASPD.

Despite its potential importance, the effect of co-occurring disorders on the alcohol-violence relationship has received little attention. A better understanding of this relationship can help to shape judicial policy on alcohol-disordered detainees. Because jails are so overcrowded (U.S. Department of Justice 1989), more arrestees are being released into the community than ever before (U.S. Department of Justice 1988). Information on the risk of violent recidivism can be instrumental in decisions about community release.

METHOD

Subjects

Diagnostic data were collected between November 1983 and November 1984 at the Cook County Department of Corrections (CCDC) in Chicago, Illinois. CCDC is used solely for pretrial detention

and for offenders sentenced on misdemeanor charges for less than 1 year.

Subjects ($N = 728$) were male detainees, randomly selected directly from pretrial arraignment. In order that the study include a sufficient number of detainees accused of serious crimes, the sample was stratified by category of charge (one-half misdemeanants, one-half felons). Persons charged with both misdemeanors and felonies were categorized as felons. Data were then weighted to reflect the jail's actual misdemeanor/felon distribution.

All detainees, excluding persons with gunshot wounds or other traumatic injuries, were part of the sampling pool. Personnel at the jail referred all persons targeted for participation in the project regardless of their mental state, potential for violence, or fitness to stand trial. Since virtually no detainee was a priori ruled ineligible, the sample was unbiased in relation to the characteristics of the larger jail population.

Subjects ranged in age from 16 to 68, with mean and median ages of 26.3 and 25, respectively. The majority were black (80.8 percent), 12 percent were Caucasian, and 6.5 percent were Hispanic. Most of the remaining (0.8 percent) subjects were Asian or Native American. Fewer than half of the detainees were employed at the time of their arrest (42.6 percent). Education level ranged from 2 to 16 years, with mean and median being 10.6 and 11.0 years, respectively. These demographic characteristics are consistent with those of urban jails nationwide (U.S. Department of Justice 1991).

PROCEDURE

Interviewers were three Ph.D. clinical psychologists extensively trained in interviewing techniques, psychopathology, and the data collection instrument. Persons targeted by the random sampling procedure (a random numbers table) were approached during the routine jail intake process by the research interviewer. The potential subjects were told that the goal of the project was "to find out more about the people who come to CCDC." The interviewer stressed that the detainees' participation would not affect their treatment while in jail nor shorten their incarceration. Detainees who agreed to participate signed a consent form and were paid 5 dollars. Persons who declined to participate proceeded through intake.

Of 767 detainees approached, only 35 (4.6 percent) declined to participate. The low refusal rate was probably due to the detainees' viewing the interview as a way of avoiding the crowded and dismal conditions of the regular intake area. Two subjects were excluded because the interviewer felt they were inventing their responses. Two others were "duplicate" subjects; they were rearrested sometime after their initial interview and again randomly selected. The final sample size (N) was 728.

Subjects were interviewed in a soundproof, private glass booth in the central receiving and processing area. Diagnostic assessments were made using the National Institute of Mental Health Diagnostic Interview Schedule (NIMH-DIS) (Robins et al. 1981a). Empirical tests have documented the reliability of the NIMH-DIS in

both institutionalized samples and the general population (Burke 1986; Helzer et al. 1985; Robins et al. 1981a, 1982; in contrast, see Anthony et al. 1985). The NIMH-DIS systematically differentiates between disorders that were ever manifest, even if currently remitted ("lifetime" disorders), and disorders in which symptoms have been recently experienced ("current" disorders).

The NIMH-DIS provides diagnostic categories rather than global psychopathology scores. Because of subject variance over time and the rarity of many disorders, it is difficult to assess the reliability and validity of psychiatric assessments such as the NIMH-DIS (Robins 1985). Nevertheless, a test-retest consistency check of 20 cases yielded results that compare favorably with other studies (Robins 1985): 93 percent agreement across all diagnoses and 95 percent agreement for the severe disorders. Two independent interviewers gave nearly identical profiles to 85 percent of the cases. Interviewer consistency was scrupulously maintained after the initial 3-month training period via mock interviews with live subjects, spot checks, and videotape training.

The interview lasted 1 to 3 hours, depending on the number of positive symptoms. After the interview, the detainee was thanked for his participation and escorted by jail staff back to the intake area.

Arrest data were obtained from Chicago Police Department records. Each detainee's file contains the "rap sheet" itemizing his arrest and conviction history. Charges incurred outside the county

are routinely transcribed from Federal Bureau of Investigation (FBI) and Illinois Bureau of Investigation (IBI) records onto the rap sheet, resulting in a relatively complete data set. For each subject, we obtained data on arrests incurred during the 3 years following the interview.

The criminal history data are mostly objective variables that require low levels of coder inference. Nevertheless, for each data collection effort, two research assistants coded the same data for at least 2 weeks so we could confirm the interrater reliability of the coding procedures. Analysis of the reliability of the coding instrument revealed interrater reliability consistently above 0.90.

DATA MANAGEMENT PROCEDURES

Diagnostic Variables

Diagnostic categories were determined conservatively. In order to meet criteria for a particular disorder, the subject had to attain the "definite" or "severe" category (whichever was applicable); all "possible" or "mild" cases were scored as absent.

In no case does the presence of one of the disorders preclude the diagnosis of another disorder via "exclusionary" criteria (see Boyd et al. 1984). Because most serious disorders tend to recur, we used lifetime diagnosis for these analyses.

Three potential confounds concerning the diagnostic criteria of the NIMH-DIS were examined prior to conducting the analyses:

(1) The diagnosis of ASPD cannot by definition be made for persons younger

than 18 years old. CCDC, however, processes some 16- and 17-year-olds who are treated by the criminal justice system as adults. Seven percent of the sample were under 18 years of age. Rather than exclude this important and controversial group from analyses, questions were added to the antisocial section of the interview that allowed the same diagnostic criteria to be presented to 16- and 17-year-olds with a less stringent age criteria. Essentially, subjects who answered positively to the occurrence of symptoms related to adult behavioral problems had a cutoff age of 15 instead of the usual cutoff age of 18. Analyses were performed both with and without the altered criteria. The results were the same. Therefore the altered criteria for the 16- to 17-year-olds were included in the data presented here.

(2) The scoring of ASPD and alcoholism have one symptom in common: problems related to driving while intoxicated. This could artificially inflate the coincidence of these two disorders. However, it was not appropriate to omit the symptom because these data would then be incomparable to other studies that used the NIMH-DIS. Therefore, analyses were performed both including and excluding the symptom. Results were the same and therefore are presented with the question included.

(3) The diagnosis of ASPD includes two questions directly related to arrest and conviction history. This poses confounds in the exploration of criminal activity by diagnosis because we know that the best predictor of future violence is past violence. Again, all analyses were

performed twice, with and without these two criteria. Restricting the diagnostic criteria had a minor substantive impact on the strength but not on the significance or direction of the results. We present the data based on the original criteria.

Defining and Measuring Violence

Violent crime included both felony and misdemeanor crimes against persons: murder, manslaughter, kidnap, aggravated battery, unlawful restraint, aggravated assault, assault, battery, robbery, rape, and deviant sexual assault.

A common problem in longitudinal research is controlling for the time spent "at risk," in other words, the time that the subject is unavailable to commit crime during the followup period (cf. Blumstein and Cohen 1979; Blumstein et al. 1986). For example, a detainee who is in jail for 2 of the 3 followup years would *ceteris paribus* be less likely to be rearrested than a person who was free the entire time. Although 85 percent of our subjects were available for at least 90 percent of the followup period, we nevertheless adjusted both variables for number of days spent in (1) Illinois State mental hospitals; (2) jail postinterview corresponding to the current arrest (these data were available from jail records; once a detainee was released from the jail, either after being found not guilty, bonding out, or after having completed his sentence, his time available for rearrest began) and (3) prison during the 3-year followup period (these data are noted on the rap sheet). This latter period of time was an estimate since detainees were routinely released before their sen-

tences elapsed. Because data on actual time served by detainees were unavailable, we weighted sentences by the calculated average sentence served by inmates in Illinois prisons based on Illinois sentencing law for a 10-year sentence, 0.475 (Illinois Criminal Justice Information Authority 1989). This figure is consistent with the national average of percentage of time served in prison (Jamieson and Flanagan 1989).

Final Sample Size

The 3-year followup data were unavailable for 32 of the subjects. An additional 50 subjects were omitted because they were in jail or prison for the entire 3-year followup. Of these 50 cases, 20 (40 percent) had an alcohol use disorder and 12 (24 percent) had a drug use disorder. These prevalence rates are comparable to our final sample. Two more subjects were omitted because their date of death was unknown. One additional case was indeterminate for our age-adjusted scoring of ASPD criteria. Because our analysis examines the two disorders that most commonly co-occur with alcoholism—drug abuse/dependence and ASPD—we also omitted 68 subjects who met criteria for other serious disorders (severe cognitive impairment, schizophrenia, or major affective disorder). Our final sample size is 575.

Design Effects

Because there were more misdemeanants than felons in the jail population, the sampling fractions were different: for misdemeanants, the sampling fraction

was 257/24299, and for felons, 318/19167. When the felony and misdemeanor rates are equal, the design effect, correcting for finite populations, is 0.8776 (Cochran 1977). For the majority of reported effects, the felony rate is higher than the misdemeanor rate, and the combined rate is below 50 percent. In these conditions, the design effect is less than 1.0. All reported standard errors and tests of significance have been corrected for these design effects.

RESULTS

We used the arrest and “time at risk” data to calculate two dependent variables: (1) probability of arrest for a violent crime 3 years postinterview, and (2) number of arrests for violent crime 3 years postinterview.

Probability of Arrest for Violent Crime During 3-Year Followup

We calculated the probability of being arrested for a violent crime for each diagnostic group by dividing the number of persons in each group who had a rearrest for violent crime by “time at risk” (expressed in months). The 3-year probabilities reported in table 1 are calculated as $1 - (1 - p)^{36}$. We estimated variances and confidence intervals using Cochran’s (1977) technique for combined ratio estimates.

Table 1 reports the probability of arrest for a violent crime by diagnostic group. We used two-tailed t-tests to compare each of the diagnostic groups with the “no disorder” group. There were no significant

TABLE I

**Probability of Being Arrested One or More Times During 3-year Followup Period
by Diagnosis, Adjusted for Time at Risk**

Psychiatric disorder	3-Year probability of arrest	Lower 95% confidence interval	Upper 95% confidence interval	Risk relative to no disorder	Contrast to no disorder group	Contrast to alcohol only group	n
Antisocial personality disorder (ASPD) only	0.38	0.16	0.54	0.97	n.s.		71
Alcohol disorder only	0.37	0.23	0.49	0.96	n.s.		62
Drug disorder only	0.33	*	*	0.84	*		23
ASPD and alcohol disorder	0.43	0.19	0.61	1.11	n.s.	n.s.	98
Both alcohol and drug disorder	0.28	0.03	0.47	0.72	n.s.	p<0.05	32
Both ASPD and drug disorder	0.42	0.16	0.61	1.10	n.s.		41
ASPD, drug, and alcohol disorders	0.39	0.18	0.55	1.00	n.s.	n.s.	80
No disorder	0.39	0.24	0.51				168
Totals	0.39	0.28	0.48				575

*Due to sample size, we are unable to compute a confidence interval for this group.
n.s., not significant.

differences between any of the diagnostic groups and the "no disorder" group.

We also used one-tailed t-tests to compare each of the alcohol groups against the "alcohol only" group. We hypothesized that co-occurring ASPD would increase the probability of being arrested for a violent crime postrelease but that co-occurring drug use disorder would decrease this possibility. We found that persons with both alcoholism and drug use disorder had a lower probability of arrest for a violent crime than persons with only alcoholism ($p < 0.05$). There were no other significant differences.

Number of Arrests for Violent Crime

For each group, we calculated the ratio of the total number of arrests for violent crime to the time at risk, modeling these counts with the Poisson procedure (Mendenhall 1987). We tested for overdispersion of the count data. There is some evidence of overdispersion but not enough to change the results of the significance tests. Table 2 presents this measure of violence. We compared each of the disordered groups with the "no disorder" group using t-tests. We found that persons with both ASPD and alcoholism had a higher rate of violent rearrest than per-

sons with no disorder ($p < 0.05$). We also compared each of the alcohol groups against the "alcohol only" group. Again, we hypothesized that persons with both alcoholism and co-occurring drug use disorder would have lower rates of violent crime postrelease than persons with only alcoholism. This hypothesis was not confirmed. We also hypothesized that persons with both alcoholism and ASPD would have higher rates of violent crime postrelease than persons with alcoholism only. This hypothesis was confirmed ($p < 0.05$).

DISCUSSION

This study generated two major findings. First, although alcoholism alone did not predict arrest for violent crime postrelease, the combination of alcoholism and ASPD did. Jail detainees who had both an alcohol disorder and ASPD were rearrested for violent crimes more often than detainees who had no disorder or detainees with only alcoholism. Second, alcoholic detainees who also had a co-occurring drug use disorder had a lower probability of arrest for violent crime

TABLE 2

*Number of Arrests for Violent Crimes Per 3-year Period by
Diagnosis, Adjusted for Time at Risk*

Psychiatric disorder	Number of violent arrests	Lower 95% confidence interval	Upper 95% confidence interval	Risk relative to no disorder	Contrast to no disorder group	Contrast to alcohol only group	n
Antisocial personality disorder (ASPD) only	0.79	0.49	1.09	1.00	n.s.		71
Alcohol disorder only	0.61	0.34	0.89	0.77	n.s.		62
Drug disorder only	0.47	*	*	0.59	*		23
ASPD and alcohol disorder	1.05	0.80	1.30	1.33	$p < 0.05$	$p < 0.05$	98
Both alcohol and drug disorder	0.86	0.34	1.39	1.09	n.s.	n.s.	32
Both ASPD and drug disorder	0.77	0.49	1.05	0.97	n.s.		41
ASPD, drug, and alcohol disorders	0.79	0.47	1.10	0.99	n.s.	n.s.	80
No disorder	0.79	0.62	0.97				168
Totals	0.80	0.70	0.90				575

*Due to sample size, we are unable to compute a confidence interval for this group.

n.s., not significant.

than did detainees who were only alcoholics.

The increased frequency of arrest for violent crime among subjects with both alcoholism and ASPD is interesting. Prior research has shown that alcoholism is exacerbated by ASPD. Antisocial alcoholics are more often "problem drinkers" than alcoholics without ASPD: They tend to start drinking at a younger age, reach alcohol dependence more quickly, consume more alcohol, have more binge drinking and blackouts, have greater impairment in social and occupational functioning due to drinking, and are arrested more often due to drinking than nonantisocial alcoholics (Cadoret et al. 1984; Jaffe et al. 1987; Jaffe and Schuckit 1981; Rimmer et al. 1972; Schuckit et al. 1977). ASPD is also exacerbated by co-occurring substance abuse (Collins et al. 1988; see Collins, this volume), resulting in increased aggression, delinquency, and crime. Thus, while the combination of ASPD and alcoholism may not increase the likelihood of arrest for violent crime, the increased severity of symptoms may lead to more frequent or chronic violent activity.

Our second important finding was that detainees with alcoholism and drug use disorder and those with only drug use disorder had a lower probability of violent crime than detainees with alcoholism only. Because of the small sample size, only the alcohol/drug use disorder group reached statistical significance. Nevertheless, this result confirms a longstanding finding in the drug-crime literature. Drug use disorder is highly correlated with property crime but is

more tenuously linked with violent crime (Abram 1989; Abram and Teplin 1990; Gandossy et al., 1980; Wish and Johnson 1986). Drug use disorder, except when co-occurring with ASPD, seems to mitigate against violent crime postrelease in this population of jail detainees, regardless of the presence of alcoholism. In short, with respect to violent crime, the combination of drug use and alcoholism may have a suppressive effect.

This study suggests that the risk of violent recidivism among released alcoholic jail detainees is affected by their diagnostic profile. Alcoholics with ASPD may be at particular risk for violent crime postrelease. This information could be useful when making parole and probation decisions. There are, however, ethical considerations when basing sentencing decisions on retrospectively calculated rates of criminal recidivism. Not only are there problems in misclassifying psychiatric disorders, but sentences would be based on crimes yet uncommitted (Anglin 1986). Diagnostic information could be useful once a decision is made. For example, if probation is the disposition of choice, the diagnostic profile may indicate the appropriate level of contact with probationary officials. Such considerations of "optimal intensity of legal supervision" may be a more appropriate application of such diagnostic information (Anglin 1986).

Our findings also highlight the fact that when violent criminal recidivism is associated with alcoholism, the association is with the least treatable type, the antisocial alcoholic. Standard outpatient substance abuse treatments have relatively

poor success with such antisocially disordered patients (Woody et al. 1985). ASPD bodes poorly for treatment of associated disorders (Rounsaville et al. 1987; Schuckit 1983). This disorder has its roots in childhood and thus requires long-term, intensive interventions (Robins 1978). It also has been resistant to treatment approaches to date. Unfortunately, ASPD often co-occurs with other disorders (e.g., depression and drug use disorders) along with alcoholism, thereby complicating an already problematic diagnostic picture (Robins et al. 1977; Smith and Newman 1990; Woodruff et al. 1971).

Several aspects of the study design should be kept in mind. First, we did not control for the subject's history of violence because of the problem of multicollinearity: If disorders cause persons to be violent, and, as a consequence, arrested, then controlling for prior arrests could obfuscate the true relationship between disorder and violence (Monahan 1992), particularly in samples which are nonorthogonal and relatively small. Yet, irrespective of disorder, the best predictor of future violence is prior violence (Monahan 1981).

Second, we did not control for age because doing so requires a much larger sample. Had we done so, our findings regarding ASPD would likely have been even stronger because age is negatively related to violence but positively correlated with being codisordered (alcoholism and ASPD). Our finding regarding drug use, however, would likely be somewhat weaker because persons with both alcoholism and drug use disorders are, on

average, somewhat older (and thus less violent) than persons with only alcoholism. Further research concerning the interaction between diagnosis, age, and violence is needed.

Third, our followup data included only detected crime. This limits our generalizability. A majority of crimes are not detected by the criminal justice system, and detected crimes are not a random sample of all offenses. It is also possible that criminals who are intoxicated at the time they offend are more likely to be arrested by the police. Because our sample included only offenders who were "failures" (arrested), our finding regarding alcoholism and violent crime could be inflated. Future research should explore violence in a broader context (i.e., including self-reported violent activity).

Nevertheless, our results demonstrate that the relationship between alcoholism and violent crime is neither simple nor direct. Controlling for associated psychopathology is important to delineate the role of alcohol in criminal activity. In addition, Collins (this volume) suggests that it may be only certain aspects of a disorder or certain symptom clusters that account for a higher involvement in aggression. A recent study (Jaffe et al. 1987) found that among hospitalized alcoholics, a history of childhood aggression was a stronger predictor of violence while drinking than was ASPD. This is consistent with the well-known finding that past violence is a strong predictor of future violence (Monahan 1981). Perhaps this symptom of ASPD—a history of childhood aggression—in conjunction

with current problem drinking leads to violence in adulthood. Future researchers should explore those aspects of ASPD and alcoholism that may be correlated with violent behavior and problem drinking. In so doing, we may better understand the role of alcohol in causing violent crime.

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Drinking Patterns and Intoxication in Marital Violence: Review, Critique, and Future Directions for Research

Kenneth E. Leonard¹

Over the course of the past 20 years, an awareness of the nature and extent of marital violence has gradually developed within the research community. Since that time, research has documented that marital aggression,² considered both in terms of lifetime and 1-year prevalence, is very widespread. For example, Straus et al. (1980), using data collected from the 1975 National Violence Survey, reported that the lifetime prevalence of marital aggression was approximately 30 percent, and the 1-year prevalence was 15 percent. In the 1985 survey, Straus and Gelles (1990) reported a yearly incidence of approximately 16 percent, with the incidence of husband-to-wife violence standing at 11 percent. Other studies reveal comparable yearly rates, although there is

considerable variability from study to study. Among general population samples, the 1-year prevalence of husband-to-wife aggression has been estimated between 11 percent (Kennedy and Dutton 1987; prevalence in Alberta, Canada) and 22 percent (Meredith et al. 1986). While the overall prevalence of aggression is high, the nature of these general population surveys has obscured the truly alarming rates among certain subgroups. In particular, the rates among younger newly married adults may be several times as large as the rates of older adults (Cazenave and Straus 1990; McLaughlin et al. 1992; O'Leary et al. 1989).

From the explosion of multidisciplinary marital violence research, a relatively consistent finding emerged, a finding that

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²The terms *violence* and *aggression* are used throughout the paper to refer to a class of behavioral actions that involve physical contact and a potential for physical injury and that occur within contexts in which the potential for injury is not a byproduct of accidental and/or benevolent intentions. *Aggression* is most typically used as a general referent for all of these behaviors, whereas *violence* is used to refer to the more severe forms of aggression. It is recognized that there are definitional controversies at both the conceptual and operational levels in this definition.

was in accord with clinical observations, experimental research on alcohol and aggression in general, as well as with a general cultural perception. This finding was that excessive alcohol use, either as a chronic, longstanding problem or as an acute condition, often accompanied marital violence. To be sure, there was often considerable variability in the extent to which excessive alcohol use accompanied such violence, a variability that could be attributed to the vastly different research samples that characterized much of the research. There were also numerous methodological weaknesses. Nonetheless, the research, with few exceptions, demonstrated the potential importance of chronic and/or acute alcohol use in understanding marital violence.

Although this early research has been reviewed previously (Leonard and Jacob 1988), a brief reprise would be useful. Much of this past research involved interviews with battered women concerning the characteristics of their husbands and the nature of the abusive circumstances. As noted above, this research was replete with methodological problems. These problems included the following: (1) lack of clear definitions of and criteria for excessive alcohol use, alcohol abuse, or alcoholism; (2) failure to collect detailed information concerning alcohol use variables as well as aggression variables; (3) the absence or noncomparability of comparison samples; (4) the implicit assumption of a uniform relation between alcohol use and marital violence over marital developmental stages; (5) the nearly exclusive utilization of clinical

samples; (6) the rare collection of data from the husband and the even rarer collection of data from both the husband and wife; and (7) a failure to adequately conceptualize the separate but related nature of the chronic and acute impacts of alcohol.

According to the reports of battered women, approximately 50 percent of their husbands had alcohol problems. In some samples, the rate was lower. In Roy's (1982) analysis of 4,000 semistructured interviews with women calling a hotline for battered wives, 35 percent of the sample indicated that their husbands were alcoholic. On the other hand, rates of 70 percent to 90 percent were also reported (Hilberman and Munson 1978; Labell 1979). Studies utilizing designs that enabled the comparison of violent and nonviolent couples with respect to patterns of alcohol use also corroborated the hypothesis that heavy drinking, alcohol abuse, or alcoholism was considerably more common among violent than nonviolent couples. In short, that excessive alcohol use is a relatively strong and consistent correlate of marital aggression does not appear to be disputed (Hotaling and Sugarman 1986; Kantor and Straus 1987; Leonard and Jacob 1988). However, whether this correlation reflects a causal link between alcohol and aggression was and continues to be controversial.

Underlying this controversy is a quieting lack of theoretically relevant data. Despite the tremendous expansion of sophisticated research concerning marital violence that has occurred over the past decade, little of that research has

been directed at understanding the role of excessive alcohol use. Instead, the significant association was often simply ascribed to one of two effects, the presumed pharmacological "disinhibition" resulting from alcohol ingestion or the ability of the abuser and his spouse to claim intoxication as an excuse and thereby maintain positive views of self and other. These conclusions were drawn in the relative absence of supportive data, either within the specific study in question or within the field more generally.

There are numerous theoretical explanations of the association between excessive alcohol use, either in a chronic or acute sense, and marital aggression. Before describing some of these paths and the evidence, or lack thereof, there are several general aspects of theorizing in this area that are worthy of note. First, it is important to recognize that these varying theoretical accounts are by no means mutually exclusive. Many of the presumed mechanisms can be incorporated into an overarching theoretical perspective that could serve to guide and refine ongoing research. Second, it is clearly the case that alcohol's status in the causal chain of marital aggression is neither necessary nor sufficient. Aggression generally, and marital aggression more specifically, probably has a number of different causal antecedents with few, if any of these, acting as necessary or sufficient to produce the behavior. Instead, marital aggression is better viewed as arising from a confluence of individual, interpersonal, and situational/contextual factors acting in probabilistic fashion. Third, it seems

likely that there are couples at greater or lesser risk for alcohol-related aggression. That is, there may be factors that differ between couples which interact with alcohol use to facilitate marital aggression. For example, couples who are very satisfied with their relationship may not ever display aggressive behavior, no matter how intoxicated one or both of them become. Fourth, any influence of alcohol on aggression might be seen as affecting the occurrence, the severity, the duration, or some other parameter of the aggression. Strictly focusing on the occurrence of marital aggression is very likely to miss any impact of alcohol among couples that already manifest many risk factors for violence. The final and perhaps most key issue is that excessive alcohol use may have an influence on the likelihood of aggression, either as a chronic pattern or through its acute effects. Although it is useful to think about the relationship between alcohol and aggression as having both an acute and chronic aspect, these two elements are not unrelated and will need to be integrated to fully understand the impact of alcohol.

This paper attempts to accomplish several things. First, it provides a heuristic model describing the potential interconnection between chronic and acute alcohol use on one hand and marital aggression on the other hand. This heuristic model is then used to organize and review empirical research pertaining to the issues of alcohol and marital violence. Finally, and again within the context of this model, several promising research directions are described and discussed.

A HEURISTIC MODEL OF ALCOHOL AND MARITAL AGGRESSION

Although previous researchers have described a variety of specific paths from alcohol use to aggression, the development of an overarching theoretical perspective incorporating these potential processes is essential to progress in this area. Pernanen (1976), in his landmark review of alcohol and aggression, described some of these processes; others who have suggested paths more specifically for marital violence include Gelles (1972), Kantor and Straus (1987), Leonard and Jacob (1988), and O'Leary (1987). The heuristic model displayed in figure 1 represents an attempt to integrate

some of the processes identified by previous researchers, incorporating both the potential direct and indirect pathways by which alcohol might be related to marital aggression. The model, despite any appearances to the contrary, does not attempt to be exhaustive with respect to the potential causes of aggression. Instead, it draws heavily on current theoretical approaches to marital aggression and attempts to specify the paths through which alcohol variables might have some explanatory value, even though some of these paths will be empirically eliminated.

The key element of this heuristic model involves an understanding of the interactional context within which marital

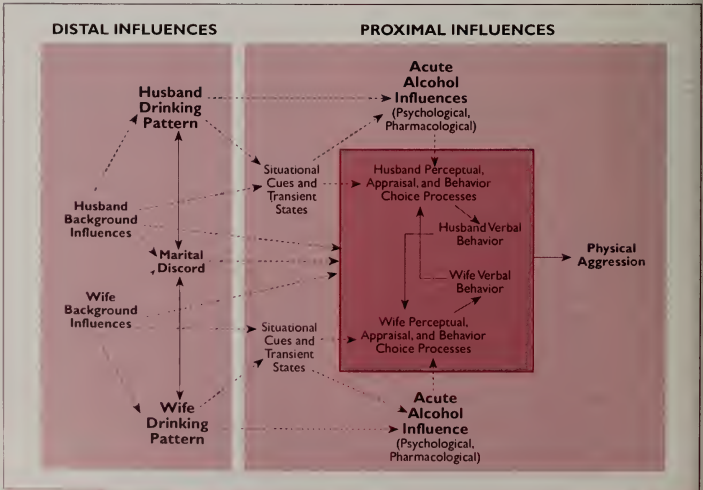


FIGURE 1
Heuristic model of alcohol and marital aggression.

violence occurs. Underlying this heuristic model is the following assumption: Most marital violence arises in the context of aversive interpersonal interactions. This assumption, although not prominent in the marital violence literature, is not new. In his classic monograph, Toch (1980) emphasized the importance of studying the violent event. He recognized that many of the violent episodes he investigated involved "a degeneration of the interpersonal interaction....To understand violence it is necessary to focus on the chain of interactions between aggressor and victim, on the sequence that begins when two people encounter each other—and which ends when one harms, or even destroys, the other" (p. 7). Others have described this degeneration of the interaction in terms of behavioral escalation. Shoham et al. (1974) described violence as a "dyadic type of interaction between Ego and Alter...[that] takes the form of an escalating series of stimulus-response cycles" (p. 418). To this rather behavioral description of violence, Boyatzis (1977) added elements of cognitive appraisal processes:

Once a person perceives a threat, he/she attempts a defensive response as an adaptation. Aggression is often a defensive response to an individual. The reactions of others to a defensive, aggressive act will most likely involve the perception of threat and another defensive response which may be aggressive. As each act intensifies the perceived threat to the individuals involved, the likelihood of

aggression as the defense chosen increases (p. 365).

Marital violence, then, is viewed as the outcome of a dynamic cognitive/ behavioral interplay between husband and wife.

The nature of the cognitive processes and the behavioral manifestations of these processes are influenced by both contextual factors that are present on a more or less episodic and temporally limited basis (proximal variables) as well as temporally more stable and situation-nonspecific factors (distal factors). Proximal influences include attributes of the immediate environment, such as physical and social context, as well as attributes that may be thought of as residing within the individual, such as transitory affective (irritability) or cognitive (easily distracted or inattentive) states. By virtue of their situational inconsistency, they may be useful in explaining why a violent couple is violent during one episode but is not violent during another, or perhaps in distinguishing between low severity, short duration aggressive episodes and severe, more extended episodes. Distal influences are factors that may be viewed as temporally stable characteristics of the couple—factors that, in a sense, reside in the background, such as gender roles, relationship discord, norms, and personality traits. These factors tend to be present across aversive interactions and are of importance in distinguishing between couples who have and have not experienced physical aggression. Distal factors, although relatively stable, should not be thought of as undeviating over time. To the extent

that such factors do change, they may distinguish between violent behavior during one time period and the absence of violence during another period. Although the interrelationship between distal and proximal factors is quite complicated and involves feedback from proximal factors to more distal factors, it is most useful to think of distal effects as being related to marital violence by virtue of their influence on the proximal and interactive elements of the model, specifically the perceptual, appraisal, and behavioral choice processes.

In sum, the evolving view depicted in the model is that marital violence arises within the context of an emergent interpersonal interaction and is shaped by the interactants' appraisal of their own behavioral options and their partner's actual behavior. These appraisals, in turn, are influenced both by proximal individual and contextual factors, as well as more distal factors, such as marital discord, hostility, self-esteem, gender role expectations, and norms concerning aggression. Alcohol consumption may be of importance through associations with and influences on distal influences on aggression, as well as through its impact on proximal-level variables.

RESEARCH ON DRINKING PATTERNS AND MARITAL AGGRESSION

Most research on alcohol and marital aggression has focused on drinking patterns and their relation to marital aggression. An association between drinking patterns and aggression suggests three

general paths in the model: (1) the relationship may be spurious; (2) drinking patterns exert a direct effect on distal factors which, in turn, effect the proximal interaction (e.g., increases marital discord that increases the likelihood of aversive interactions); and (3) acute alcohol use has an impact on violence, and drinking patterns simply reflect an increased probability of acute use.

Studies of drinking patterns and marital aggression can provide useful information of several sorts. First, such studies can serve to establish that there is an association between alcohol and marital aggression to be explained. Second, these studies are useful in determining whether the association is spurious, with the same background factors leading to both excessive drinking patterns and, through their impact on proximal factors, marital violence. In a similar vein, studies conducted at the distal level can determine to what extent the relationship between drinking patterns and marital violence is mediated through alcohol's impact on other distal variables, a model of indirect effects. However, the most important and underutilized value of studies at the distal level is the identification of high-risk characteristics that can provide leads with respect to the process of marital violence. Such factors can then be brought into closer scrutiny by incorporating them into studies at the proximal level.

There is a considerable body of research linking drinking patterns, such as frequent heavy drinking or drunkenness and alcohol abuse/dependence diagnosis, to physical aggression. These include

studies of the prevalence of marital violence among alcoholic men and controls, the prevalence of alcohol problems among batterers, as well as the correlation (co-occurrence) of alcohol problems and marital aggression among nonclinical samples. For the most part, these studies have been rather limited in scope. However, three important questions can be addressed by this literature: (1) Is there a relationship between drinking pattern and marital aggression after controlling for the broad range of factors that can influence both drinking and violence? (2) Are there any factors that in combination with drinking pattern predict the aggressive status of the couple? (3) Do these relationships extend to women's drinking patterns? Literature bearing on these issues will briefly be described.

Is the Association Between Drinking Patterns and Marital Violence Spurious?

One hypothesis concerning the relationship between drinking patterns and marital violence that should be entertained is that the same individual, interpersonal, and social situations that produce excessive drinking also produce marital violence. It is clear from the literature that there are many common influences on or at least common correlates of excessive drinking and marital violence. These include anger or hostility, depression, low self-esteem, high stress, low coping skills, low social support, violence in family of origin, as well as sociodemographic factors such as age, socioeconomic status, and racial/ethnic background. Although

studies controlling for all of these common influences have not been conducted, a number of studies have examined the correlation of drinking patterns with parameters of marital aggression after controlling for a number of these influences. Leonard et al. (1985) studied a sample of white factory workers and reported that *current* alcohol abuse/dependence was related to the occurrence of physical conflict in the marriage. Furthermore, the relationship was significant after controlling for sociodemographic factors, hostility, and marital satisfaction. This finding was essentially replicated by Leonard and Blane (1992), who found that problematic alcohol use was associated with marital aggression in a nationally representative sample of 22-year-old men after controlling for demographic factors, hostility, self-consciousness, and marital satisfaction. Kantor and Straus (1987) examined the role of the husband's drinking pattern in marital violence within a nationally representative sample of 5,159 couples. This study was conducted in the context of examining whether drinking patterns, occupational status, and norms concerning aggression interacted to predict violence. The implications of the interactions of this study will be discussed in a later section. However, for the present, it is worth noting that heavier drinking patterns were associated with the occurrence of marital aggression, even among white-collar men who maintained a disapproving attitude toward aggression. In our more recent work focusing on the early years of marriage (Leonard

and Senchak 1992), we have found that a heavy drinking pattern marked by frequent intoxication among husbands was related to the occurrence of premarital aggression. This association remained strong and significant after controlling for husband and wife hostility, marital dissatisfaction, and sociodemographic factors.

There have been fewer studies within marital abuse samples or alcoholic samples, and these have not always provided consistent findings. Reider et al. (1988) reported that among alcoholic husbands and their wives, the severity of alcohol problems on the part of the husband was significantly related to the husband's cumulative violence toward his wife after controlling for antisocial behavior, perception of family conflict, and age. Gondolf and Foster (1991) assessed 218 patients in an alcohol rehabilitation program for veterans. Among this relatively older, lower socioeconomic status, and more severe alcoholic group, scores on the short form of the Michigan Alcoholism Screening Test (MAST) did not correlate with scores on the Conflict Tactics Scale or with the occurrence of an assault or a severe assault.

Several studies have looked within maritally violent samples to determine whether drinking patterns related to marital violence. For example, Berk et al. (1983) examined 262 domestic disturbances in which the police were called and which involved an ongoing romantic relationship between an adult man and an adult woman. Data were collected from the police officer reports and from information gathered by the district attorney's

office. Previous charges for alcohol-related behavior were marginally related to the severity of female injuries. Schuerger and Reigle (1988) evaluated 250 men in group treatment for wife abuse. Utilizing a violence score weighted for severity and frequency, they reported that this index was significantly correlated to scores on the MAST. However, the extent of the relationship, after controlling for sociodemographic factors, was not reported.

Given the paucity of data, it is not yet clear whether a pattern of excessive drinking, alcohol abuse, or alcohol dependency is predictive of frequency or severity of violence among clinical samples of batterers. Nor is it entirely clear, given a certain high level of chronic alcohol use such as one finds among inpatient alcoholics, whether differences in the severity of alcohol abuse are related to marital violence. There are, of course, statistical reasons for expecting these latter two relationships to be attenuated relative to a sample including a less restricted range on marital violence and drinking patterns. However, the extant studies do suggest that the relationship between drinking patterns and the occurrence of marital aggression is consistent across a number of different samples and remains significant after controlling for sociodemographic as well as more substantive factors that could create a spurious relationship. There are always, of course, additional candidate variables that could create a spurious effect. Notably, however, the research reviewed here examined several of those variables most theoretically germane to marital violence, including hostility (or anger or approval of

violence) and potent sociodemographic factors. These studies have also controlled for marital conflict, verbal conflict, or marital satisfaction, given the plausible hypothesis that marital discord may influence drinking patterns. In controlling for these relationship parameters, any potential indirect influence of drinking patterns on violence by way of relationship issues is also controlled for. Thus, it is clear from a variety of studies that drinking patterns are associated with other distal factors that are related to aggression and that a certain portion of the variance in marital violence is attributable to the distal factors serving as spurious factors. Nonetheless, drinking patterns in the husband appear to remain strongly related to marital violence after controlling for background and relationship factors.

Interactions Between Drinking Patterns and Distal Factors

One area in which studies of the distal predictors of marital aggression may be particularly helpful is in delineating characteristics that interact with drinking patterns to predict the occurrence, frequency of occurrence, or severity of marital violence. Research addressing this issue would be useful not only in defining high-risk groups for marital aggression, but also for possibly identifying additional distal pathways by which drinking patterns might influence violence. Furthermore, factors identified as interacting at the distal level would be prime candidates for study at the more proximal level.

To date, there have been only two published studies that have explored the

possibility of husband or wife drinking patterns interacting with other background variables. In the first of these, Kantor and Straus (1987), which was briefly described previously, examined the interaction among husbands' drinking pattern, husbands' approval of violence, and socioeconomic status. These investigators built their argument from the perspective that alcohol abuse problems, including the expression of hostile feelings while drinking, norms tolerating male aggression within a marriage, and actual levels of wife abuse, are more prevalent among lower socioeconomic status families. On the basis of literature supporting each of these points, they hypothesized that the husband's drinking pattern would be more strongly related to marital aggression among blue-collar men maintaining norms supportive of marital aggression. Based on their analyses of the 1985 National Family Violence Resurvey, their findings indicate that heavier drinking patterns, particularly binge drinking, were associated with marital violence, even among white-collar men who disapproved of violence. However, the effect was very much stronger among blue-collar men and men supportive of violence.

The second study to examine the interactions between drinking patterns and other distal factors in the prediction of marital aggression was Leonard and Blane (1992). Since this study was derived from a larger study concerned with drinking and drinking problems among a nationally representative sample of young men, only a very brief measure of marital aggression was assessed.

Balanced against this weakness were several strengths, including the extensive personality measures that were collected. The basic premise of this investigation was that the husband's drinking pattern per se would not be likely to create a motivation to aggress. However, heavier drinking patterns in the presence of aggressive motivations would be predictive of marital aggression. The results suggested that a pattern of risky drinking (a high score on the Alcohol Dependence Scale) was associated with marital aggression among men with high levels of negative affect (Trait Anxiety, Hopelessness, Social Avoidance and Distress, Suspicion, Resentment, and Fear of Negative Evaluation). Also, there was an interaction among risky drinking, marital satisfaction, and hostility (Trait Anger Scale, assault, social anhedonia, resentment, and suspicion). This interaction suggested that drinking patterns were strongly associated with marital aggression among the highly hostile subjects, irrespective of marital satisfaction. However, among low hostile subjects, risky drinking was associated with marital aggression only among those low in marital satisfaction.

In our recent study of alcohol and premarital aggression in newlyweds (Leonard and Senchak 1992), we investigated a social learning model of alcohol and aggression that posited interactions among heavy alcohol use, alcohol beliefs, and aggressive motivations. More than 600 couples entering their first marriage completed an in-person interview and a series of self-report questionnaires assessing hostility, marital dissatisfaction, alco-

hol beliefs, and alcohol use. As noted above, husbands' alcohol use was significantly associated with premarital aggression. In addition, there was a significant interaction between the husband's heavy alcohol use and marital dissatisfaction in predicting premarital aggression, indicating that alcohol use was associated with aggression among couples in which the husband was at the mean or higher in marital dissatisfaction. Furthermore, the interaction between alcohol use and the belief that alcohol causes aggression was significant. This interaction suggested that alcohol was not associated with premarital aggression among men who scored very low on the belief that alcohol causes aggression. However, among men who scored at the mean or above, the relationship was significant. Finally, there was a significant interaction involving hostility, the belief that alcohol is an *excuse* for aggression, and the husband's heavy drinking. This interaction suggested that among hostile men, heavy alcohol use tended to be associated with higher frequencies of premarital aggression, irrespective of their belief about alcohol as an excuse. However, among low hostile men, heavy alcohol use was only associated with premarital aggression among men who viewed alcohol as an excuse for aggression.

The basic value of studies focused on interactions between drinking patterns and distal variables is that they may identify characteristics that put one at an elevated risk for marital aggression when combined with risky drinking patterns. Although not designed specifically for this purpose, studies of subgroups of batterers

and their associated characteristics can sometimes address this issue. For example, if a study reported that violent heavy drinkers perpetrated more serious acts of violence and were higher in jealousy, one possible inference could be that jealous men were highly susceptible to the effects of alcohol and that this combination might produce very severe violence. Although such a hypothesis would be directly testable in such studies, the tests are seldom done, primarily because alcohol is not the prime focus of the study.

As with studies of statistical interactions, there are only a handful of studies that address the issue of whether drinking patterns demarcate a different group of violent couples, and few of these were designed specifically to address this question. In one of these, Hamberger and Hastings (1991) assessed 38 alcohol-abusing batterers and 61 nonalcohol-abusing batterers identified through court referral and self-referral to a violence abatement program. These two groups were compared to 31 maritally discordant and 34 maritally satisfied men drawn from marriage and family therapy and medical clinics and from marital adjustment seminars sponsored by churches and other organizations. The alcohol-abusing batterers, more so than the two groups of nonviolent men, reported witnessing parental violence and experiencing parent-to-child violence. The nonalcohol-abusing batterers were not different from the nonviolent groups in this respect. For example, among alcohol-abusing batterers, 50 percent reported parental violence, and 50 percent reported that they had been

abused. Among the maritally discordant and maritally satisfied groups, these figures were under 10 percent. The nonalcohol-abusing batterers were in an intermediate range, with 21 percent reporting parental violence and 23 percent reporting parent-to-child violence. There were also significant differences among the groups on personality variables. In particular, alcohol-abusing batterers scored higher than nonalcohol-abusing batterers on the Avoidant, Aggressive, Negativistic, Borderline, Psychotic Thinking, and Psychotic Depression scales from the Millon Clinical Multiaxial Inventory. As described by these authors, these "alcoholic batterers appear to be extremely distressed and dysphoric. They exhibit characteristics related to alienation, unpredictable moodiness, and volatile overresponsiveness to interpersonal slights" (p. 143). Unfortunately, differences in terms of the extent of marital violence were not reported.

Although other direct comparisons of maritally aggressive men differing in drinking patterns have not been conducted, research focusing on typologies of aggressive men has sometimes provided pertinent information. For example, Gondolf (1988) cluster-analyzed interview data from approximately 6,000 women admitted to 50 Texas shelters for abused women. Among the dimensions assessed were physical abuse, verbal abuse (largely threats), blame after the abuse, substance abuse (alcohol/drug abuse and arrests), general violence (violence outside of the family), and previous arrests. Three separate cluster analyses were conducted, with

525 cases in the first cluster analysis. Two additional subsamples of equal size were then utilized to verify the results. Although three clusters could be differentiated, and these appeared to replicate across the three samples, the extent of substance abuse was relatively high in all three clusters.

Saunders (1992) assessed 182 men at the time of admission to a treatment program for men who battered. This sample of predominantly white (76 percent), court-referred (70 percent) men provided information on the extent of generalized violence, childhood victimization, severity of violence, psychological abuse, attitudes concerning women's roles and marital power, level of marital conflict, partner anger, jealousy, depression, social desirability, and the extent to which alcohol was involved in abusive incidents.³ Of the three clusters identified, only one reported little alcohol use in violent episodes. The greatest extent of alcohol involvement in aggression occurred within Type II, which was characterized as being the most severe and generally violent group. Alcohol involvement was also characteristic of the Type I, family-only aggressors, men with lower levels of anger and depression but higher scores on social desirability. This group also reported very little abuse in their backgrounds, low violence outside of the home, low marital conflict, and low psychological abuse. Saunders speculates that this group can be

characterized as suppressing anger and avoiding conflict until alcohol or another stressor releases it.

Given the relatively few studies of drinking patterns and distal factors as predictors of marital aggression, definite conclusions are difficult to draw. There seems to be some evidence that alcohol use is more strongly related to marital aggression in the presence of significant hostile motivations, although it is often related to violence even in the apparent absence of such motivation. It may be that other aggressive motivations may be present among those low in the aggressive motivation under study. Furthermore, the absence of aggressive motivations at the distal level does not mean that an individual might be aggressively motivated on a more occasional basis. Finally, aggressive inhibitions should be considered more thoroughly. The findings reported by Saunders (1992) suggest that alcohol may have its most significant impact on individuals who can be characterized as high on overcontrolled hostility. From a theoretical perspective, men who maintain high instigations and high inhibitions to aggress would be most likely to increase their aggression in response to alcohol (Steele and Josephs 1988). It seems worthwhile to encourage future studies examining the joint impact of aggressive instigations, aggressive inhibitions, and heavy alcohol use on marital aggression.

³ Although alcohol involvement in abuse episodes may be more properly considered in the proximal portion of the model, the estimate of the extent to which alcohol is involved across multiple episodes reflects a blend of variables. Given that many of the other variables examined in this study are distal in nature, this study is described here rather than in the proximal section.

Wives' Drinking Patterns and Marital Aggression

Although it is common to think primarily of the aggressive husband when considering alcohol-related aggression, excessive alcohol use in the wife may also be of importance. While the obvious situation involves acute alcohol consumption, the impact of the wife's drinking pattern can also be viewed within a similar heuristic framework. Although we can ask the same basic questions that we did for the husband's drinking, the limited data allow us to begin to address only one of these: Does the wife's drinking pattern relate to experiencing marital aggression,⁴ or is any observed relationship spurious? Our attempts to answer even this question should be considered preliminary.

Although a number of studies have linked patterns of excessive alcohol consumption among women with victimization within the marriage, the findings have not been entirely consistent. Miller et al. (1989), for instance, compared 45 alcoholic women with 40 women from a random sample of women in the community. Alcoholic women reported significantly higher levels of verbal conflict, as well as moderate and serious violence, in their marriages. This relationship remained after controlling for sociodemographic differences as well as history of alcoholism and violence in the family of origin and her husband's alcohol problems. In a more extensive study, Miller (1992) found that alcoholic women were more likely to report moderate and severe

violence from their most recent partner than either women apprehended for driving under the influence of alcohol or women from a random sample. However, these differences did not remain significant after controlling for the alcohol problems of their partner. Furthermore, the rate of partner violence among alcoholic women did not differ from the rate among women receiving treatment at a mental health facility. Miller et al. (1990) examined the extent of marital violence among 82 male parolees and their spouses. The interaction of a parolee's alcohol problems and his wife's alcohol problems significantly predicted marital violence. Although neither husband nor wife alcohol problems were significant predictors of the extent of marital violence, the interaction was a significant predictor. The nature of the interaction suggested that alcohol problems in the wife were related to violence only among men who scored low on alcohol problems. Stated in a somewhat different way, violence was more likely among couples in which either the husband, the wife, or both evidenced alcohol problems. Amaro et al. (1990) interviewed 1,243 pregnant women, a sample composed of predominantly poor, urban, minority women. Although the measurement of violence is unclear, these authors reported that approximately 7 percent of the women reported physical or sexual abuse during the pregnancy.⁵ The average daily alcohol consumption of the woman and the use of illicit drugs by her partner were signifi-

⁴From a theoretical perspective, alcohol consumption could lead women to be aggressive. However, research concerning women's drinking and women's maritally aggressive behavior is lacking.

cant risk factors in predicting violence after controlling for sociodemographic factors and violence during the 3 months prior to pregnancy.

Despite these results suggesting that wives' drinking patterns are related to being a victim of marital violence, several studies report somewhat contradictory results. Reider et al. (1988) examined wives of alcoholics and reported that the extent of the wife's alcohol problems was not related to marital aggression, although her usual alcohol consumption (as measured by the Quantity-Frequency-Variability Index) was inversely correlated with the cumulative intensity of the husband's marital aggression. Studies of general population samples also have not strongly confirmed an association between wives' drinking pattern and marital aggression. Kantor and Straus (1989) reanalyzed data from their 1985 national probability sample of households and focused on husband and wife drunkenness as predictors of minor and serious wife abuse. Although husband drunkenness was related to both minor and severe violence, wife drunkenness was only related to minor violence. In our own work (Leonard and Senchak 1992), the wife's excessive drinking, as measured by her average daily consumption, frequency of drunkenness, and scores on the Alcohol Dependence Scale, was univariately associated with reports of the husband's aggression to his spouse prior to marriage. However, these univariate associations were no longer significant after controlling

for the drinking patterns of the husband. Nor was there any evidence of an interaction between husband and wife drinking patterns in predicting aggression.

In attempting to understand these mixed findings, several points are worth noting. First, it is critical that both the husband's and wife's drinking be assessed. There is a considerable body of research indicating a strong relationship between husband and wife drinking patterns, and this relationship holds among general population samples (Boye-Beaman et al. 1991) as well as among clinical populations (Jacob and Bremer 1986). As a result, associations between the wife's drinking pattern and marital violence could easily be spurious, with the association arising from these factors being related to the husband's drinking pattern. However, several studies did report an association after controlling for the husband's drinking. Second, only two studies have specifically examined the possibility that husband and wife drinking patterns might interact to predict marital aggression. When one considers the possibility that in part, the relationship between drinking patterns and marital violence can be attributed to a deleterious impact of alcohol on marital satisfaction, the theoretical significance of considering the configuration of the couple's drinking patterns becomes rather clear. For example, it seems likely that heavier drinking among wives would be particularly disruptive in couples in which the husband is a light or nonproblem drinker. This

³Although the identity of the perpetrator of the violence was not assessed, anecdotally, the authors reported that a large proportion of the violent episodes involved a male partner.

seems like a reasonable explanation for the interaction observed by Miller et al. (1990). Finally, the studies that failed to find an association, or a very strong association, between wife drinking and victimization involved studies of nonproblematic women in the general population, while studies that reported a relationship often involved very socially disadvantaged or deviant populations. As a result, the impact of heavy drinking among women might be discernable only in some populations and only at very high levels of drinking.

RESEARCH ON ALCOHOL CONSUMPTION AND MARITAL AGGRESSION

Most of the marital aggression literature has focused on distal predictors of aggression and has involved the assessment of presumably situationally invariant characteristics, such as attitudes toward gender roles and masculine power, hostility, self-esteem, and jealousy. These have been associated with patterns of aggressive behavior, collapsed over episodes either implicitly by the subject or by the researcher. While such an approach can highlight high-risk groups and thereby provide leads with respect to the process of marital violence, it does not provide an understanding of the underlying processes that lead to a maritally violent event.

Evidence regarding the proximal impact of alcohol on the processes involved in the escalation of the aversive interaction to aggression is very sparse. There are currently three areas in which

information is available: (1) the extent to which alcohol is present in episodes of violence, (2) the association of alcohol in the episode with other contextual and interactional factors, and (3) the impact of alcohol on aversive interactions.

The Presence of Alcohol in Episodes of Marital Aggression

Alcohol consumption often accompanies violence. Studies of homicide and assault that focus on the proximal context of violence clearly substantiate that in many cases of violence, either the violent offender, the victim, or both had been drinking. PERNANEN'S (1976) review indicated that alcohol was present in approximately 50 percent to 60 percent of violent episodes. The data with respect to marital violence are somewhat comparable, although it is often the case that the reported rates of alcohol use and violence in the marital context are somewhat lower than the reported overall rates across other contexts.

A number of studies have been concerned with drinking involvement in violent episodes that come to the attention of the police, either because a homicide is committed or because the police were responding to a domestic disturbance call. Two studies are available focusing on spouse homicides. In WOLFGANG'S (1967) study of criminal homicide, he reported on 38 family slayings, 28 of which were wives killing husbands, while 5 were husbands killing wives. Alcohol intoxication in the victim, usually the husband, was related to victim precipitation in the homicide. That is, if the husband was

drinking, he was likely to have initiated the violence that culminated in his death. Chimbos (1978) studied 34 men who had murdered their wives and found that the offender had been drinking prior to the homicide in 71 percent of the cases. Although there are many other studies of alcohol and homicide, few present information concerning the presence of alcohol among spousal homicides.

There is also a considerable body of literature addressing the presence of alcohol among the offenders and victims of assault. Again, however, only a few studies have looked explicitly at instances of spousal assault. Bard and Zacker (1974) indicated that among domestic disturbances investigated by the police, either the complainant, the other person, or both were drinking according to the police in 56 percent of the cases. In a subsequent study, this figure was considerably less, 35 percent (Zacker and Bard 1977). In a study described earlier, Berk et al. (1983) examined 262 domestic disturbance reports to the police and district attorney's office. In 18 percent of the cases, the husband was drinking, while in 5 percent the wife was drinking. Roberts (1987) examined prosecutor's files of 234 cases of domestic violence. This sample consisted primarily of cohabiting couples and separated or divorced couples. Nearly half of the sample was black, and a similar percentage was unemployed. With respect to the abuse for which the charges were filed, 60 percent of the women reported that the abuser was under the influence of alcohol. Pernanen (1991), as part of a comprehensive study of alcohol and violence, ana-

lyzed police records for a 1-year period to determine the extent to which the reporting officers indicated drinking by offenders or victims. Because the police reports did not have an explicit question concerning drinking, the presence of alcohol was coded from the narratives, a procedure that the author indicated represents the minimum involvement of alcohol in the episode. Of the 749 police reports of violence, 160 involved spouses or common law partners. Most of these involved husbands as offenders and wives as victims. The analyses indicated that 43 percent of offenders and 16 percent of victims were noted as having been drinking. This represents the highest level of alcohol involvement among offenders and the lowest level for victims in comparison to violent acts between individuals in other relationship categories.

Rather than focusing on episodes in which police have been summoned, other studies have identified victims, batterers, or violent couples and asked them to report on the presence of alcohol in aggressive episodes. Much of this literature is concerned with the estimated presence of alcohol across a series of aggressive events. For example, Gayford's (1975) study of 100 women seeking admission to a women's shelter noted that 44 percent of the women indicated that the violence "occurred regularly" when the husband was drunk. Gelles (1972) found that in 48 percent of violent families, drinking accompanied the abuse.

Several studies have focused on whether alcohol was present in a specific index event. For example, Pernanen

(1991) conducted an epidemiological survey in the same community as his study of police records over roughly the same time period. Among the approximately 450 accounts of the most recent aggressive episodes provided by the community sample, approximately 90 (20 percent) involved marital abuse. In these instances of marital abuse, 44 percent of assailants and 14 percent of victims had been drinking. As in the analyses of police records, marital violence evidenced the highest presence of alcohol for the assailant and the lowest for the victim of all the relationship types reported. Among respondents reporting on the most recent and most violent act in the 1985 National Violence Resurvey (Kantor and Straus 1987), 22 percent reported that the husband had been drinking, and 10 percent indicated that the wife had been drinking. Overall, one or both had been drinking in 24 percent of the cases. However, among high and binge drinkers, the figure was approximately 48 percent. In our own research, wives indicated that approximately 40 percent of aggressive husbands had been drinking prior to the first episode of violence after marriage. Among husbands who admitted to violence, approximately 25 percent indicated that they had been drinking prior to the first episode after marriage. By both husband and wife reports, it was rare for a wife to have been drinking prior to the violent episode.

Overall, this literature indicates that a substantial proportion of violent events are accompanied by alcohol use, with estimates ranging from 22 percent (Kantor and Straus 1987) to 60 percent (Roberts

1987). Although it is sometimes the case that both the husband and wife have been drinking, most of the research suggests that drinking in the episode is far more prevalent among the husbands than among the wives, unlike the research for violence more generally, in which it is most likely that both the offender and victim have been drinking. Also, it is clear that the presence of alcohol in a violent episode is far more common among those with a heavy drinking pattern than among those with a less heavy pattern, although this may simply reflect that heavier drinkers are more likely to be drinking during any given timeframe than lighter drinkers, irrespective of any behaviors displayed. Finally, it appears that relatively few individuals display a consistent pattern of alcohol presence in episodes of violence. That is, among men with more than a single episode of violence, only a minority display aggression only while drinking.

Aside from these very general and to some extent commonsense conclusions, these figures provide very little information. In particular, the general finding that perhaps 40 percent of marital aggression episodes occur after the husband has been drinking would be unimpressive if the at-risk population has been drinking in 40 percent of their nonviolent interactions as well. That is, if one were to assume that alcohol consumption had no impact on marital violence, what proportion of episodes would be accompanied by drinking by chance or through the operation of the spurious and indirect paths from drinking patterns to marital aggression? Before one assumes that a high

prevalence of drinking during violent episodes is reflective of an association between alcohol and violence, this prevalence figure must be compared to some other estimate of alcohol use during some form of nonviolent episode, and this must be done controlling for distal factors, preferably through the use of a within-subjects design. Nonetheless, the figures do provide justification for the *potential* significance of alcohol consumption. In contrast, had alcohol consumption been found in a relatively small percentage of violent events, the practical importance of alcohol would have been judged to be minor, even though it may have still exerted a causal influence.

Characteristics Associated with the Presence of Alcohol in the Episode

One potential contribution of studies of alcohol use at the episodic level is the possibility that by relating the presence/absence of alcohol to the occurrence/nonoccurrence of violence or to some other violence parameter, one could support the hypothesis that alcohol consumption is causally related to aggression. Several studies have approached the issue in this fashion. In the earliest of these, Bard and Zacker (1974) compared domestic disturbances in which the police judged that a physical assault had occurred with disturbances in which they judged that an assault had not occurred. Of the 952 codable domestic disturbances, there were 252 cases of alleged assault, 72 cases of intoxication, and only 15 in which there were allegations of both. Based on the officers' impressions of alcohol use

and assault, there was a significant relationship; alcohol use was actually less prevalent in instances of alleged assault than in instances in which no assault was alleged. Among the limitations of this study are the uncertain validity of police perceptions of intoxication (Pagano and Taylor 1979), the questionable assumption that the failure to allege an assault to the police meant that no assault had occurred, and the possibility that the presence of the police prevented some of the domestic disturbances from escalating to assault (Frieze and Schafer 1984). Furthermore, alcohol may have exerted an overall impact of verbal aggression.

Stets and Henderson (1991) provided a conceptually similar approach to the Bard and Zacker study but did so with a self-report interview study of dating violence. Telephone interviews were conducted with 272 never-married subjects between 18 and 30 years of age who reported at least 6 dates with a given individual over 2 months in the last year. The focus of the interview was on the most recent verbal or physical aggressive episode. Approximately 30 percent of women reported experiencing physical aggression, while 22 percent of men reported using physical aggression. Drinking before an incident was related to a greater likelihood of using and receiving physical as opposed to verbal aggression, a finding in direct contrast to that reported by Bard and Zacker.

Several studies have examined the relationship between the presence/absence of alcohol in the violent episode and characteristics of the violent episode, such as the severity of the aggression (most often

judged by the extent of injuries). Fagan et al. (1983) interviewed 270 clients of domestic violence services. The extent to which drinking accompanied episodes of violence was not related to the severity of the most serious injury. However, it should be recognized that physical injury in the victim is not tied in a one-to-one fashion to the intensity or severity of the assailant's aggressive behavior. More importantly, the extent of drinking during episodes represents a variable collapsed over episodes and may not reflect whether the abusive man was drinking or not during the episode that led to the most serious injury. Berk et al. (1983), in a study described previously, analyzed 262 domestic disturbances in which the police were called and which involved an ongoing romantic relationship between an adult man and an adult woman. Although, as noted previously, the man's drinking pattern was related to the severity of the victim's injuries, drinking by the violent offender and by the victim were unrelated to injury.

The most comprehensive analyses of contextual differences between aggressive episodes involving alcohol versus episodes not involving alcohol is provided by Pernanen's (1991) study of violent events in the community. Because his focus was on alcohol and aggression more generally, however, many analyses pertinent to the issue of marital violence could not be conducted with sufficient statistical power to be compelling. However, some of his findings are of interest. In particular, as part of an analysis of whether alcohol consumption leads to less discrimination in

the choice of violent acts, Pernanen presented the percentage of individuals reporting that a specific aggressive behavior, such as pushing, slapping, or punching, occurred in the most recent episode of violence as a function of the gender of the victim and whether the assailant had been drinking. Virtually every category of aggressive behavior, with the exceptions of "throwing an object" and "other violent acts," had a higher prevalence when the assailant was drinking. Although the analyses were not conducted to test this specifically, this might indicate that male-female violence (predominantly spouse abuse) involves more acts of violence in a given episode when the assailant is drinking as opposed to sober. Pernanen also found that the likelihood of injury in cases of marital violence was 26 percent when the assailant had been drinking but only 13 percent when the assailant was not drinking. Given the relatively small number of marital violence cases, this difference was not statistically significant.

Although the above studies provide some preliminary information concerning the proximal context of marital violence with respect to alcohol consumption, one must be very careful in drawing conclusions from these studies. From a methodological perspective, these studies contrast episodes of violence in which an aggressive individual has been drinking with episodes in which an aggressive individual has not been drinking. Differences between the two types of episodes in terms of the acts utilized by the assailant (verbal versus physical, or mild physical versus more serious physical) or the harm

experienced by the victim are then used to infer something about the effect (or lack of effect) of alcohol on the nature of violence. However, these inferences would be valid only insofar as two basic assumptions hold: (1) episodes involving alcohol versus not involving alcohol are comparable in other respects, and (2) the actors in the different kind of episodes are comparable. Recall the model described earlier and our assumption that marital violence arises from a variety of sources. One man who has been drinking but has no other proximal influences on violence might behave as severely as another man who has not been drinking but who has multiple proximal influences. The conclusions one would draw about the effect of alcohol without controlling for these other proximal influences would be quite different from the conclusion one would draw after controlling for these other influences. Similarly, to the extent that there are individual difference factors related to the likelihood that marital violence would be accompanied by alcohol use, such factors need to be ruled out as influences on the severity of violence.

Alcohol Consumption and Marital Interaction

In contrast to the research described to this point, which has been predominantly based on self-report survey methodology, studies of alcohol consumption and marital interaction represent an experimental approach to understanding the impact of alcohol on interpersonal behavior. Experimental approaches to the effects of alcohol on interpersonal behaviors such as aggression

have numerous strengths. Specifically, distal influences that can confound survey methodology can be dealt with, either by random assignment to alcohol versus no alcohol administration, through covariance analyses, or through selecting groups of subjects differing with respect to a given distal factor and observing the relative impact of alcohol on aggression in those different groups. At the more proximal level, transient states that might influence behavior can be measured and controlled. More importantly, the context of the experiment is standard, and the subjects are uniformly confronted with the same objective scenario, although there may be subjective differences in the interpretation of the context. Important contextual variables can also be manipulated independent of alcohol consumption. Finally, this approach allows for the independent manipulation of both distal and proximal variables in conjunction with alcohol consumption, thereby allowing for the examination of conditional or synergistic effects of alcohol consumption on aggressive behavior.

Although there are numerous experimental studies examining the effects of alcohol on aggressive behavior, most of these studies involve male-to-male aggression among individuals who have never met. The paradigm is highly structured, the behavior of the "victim" is programmed, the response options are limited, and the manner in which aggression is delivered is unusual. While these studies have provided important information concerning the possible mechanisms by which alcohol might facilitate aggression, the generalizability of these findings to

marital aggression is uncertain. Indeed, it seems likely that these typical aggression paradigms would be ill suited for studying marital aggression.

Although not designed specifically for examining marital violence, the potential for utilizing a marital interaction paradigm for understanding such violence has been recognized for some time (Leonard and Jacob 1988). In this paradigm, areas of current marital conflict are assessed, and the couple is asked to discuss this conflict with the aim of making some progress. The videotape of the ensuing discussion is coded by coders blind to the purpose of the study. Coding systems have been designed to assess a broad array of behaviors, both positive and negative, in which a couple might engage. This paradigm retains much of the value of controlled experimental studies but allows for a more naturalistic assessment of the impact of factors potentially related to marital aggression.

Despite the strengths apparent in this methodology, it must be acknowledged that the dependent variable is not physical aggression but rather some form of verbal aggression or conflict. As a result, such studies, if they are to be applicable to marital aggression, must assume that similar processes underlie increases in verbal aggression and the occurrence of physical aggression. However, there is some preliminary evidence suggesting that maritally aggressive couples and maritally distressed couples can be distinguished within this paradigm (Margolin et al. 1988), providing some discriminative validity to the procedure.

Although there have been no published studies to date that have investigated the impact of alcohol on marital interactions of aggressive and distressed couples, a number of studies have examined the impact of alcohol on alcoholic and nonalcoholic couples. These studies provide some preliminary information on the impact of alcohol on marital interactions, although firm conclusions will have to await other investigations.

The earliest published work in this regard was conducted by Billings et al. (1979). Alcoholic, maritally distressed, and normal couples were asked to enact conflictual scenes with and without alcohol use. Both alcoholic and distressed couples engaged in more hostile acts than did normal couples, but alcohol use had no discernible impact on any of the groups. The absence of differences in this study could easily be attributed to the fact that the alcohol manipulation involved simply the availability of alcohol. Almost half of the subjects chose not to drink, even with alcohol available; most of those who chose to drink had only one to two drinks. Frankenstein et al. (1985) reported on eight alcoholic couples observed both while sober and after a fixed dose of alcohol. Alcohol led to increases in positive affect, primarily on the part of the wife.

The most consistent, programmatic work in this area has been conducted by Jacob and colleagues (Jacob and Krahn 1987; Jacob and Leonard 1988, 1992; Jacob et al. 1981; Leonard 1990). In an initial study, Jacob et al. (1981) assessed alcoholic and control couples in two

problemsolving tasks, one based on a relatively structured and impersonal task and one based on the resolution of current areas of marital conflict. These two tasks were completed on two different occasions, once with alcohol available, and once with only soft drinks available. Although alcohol availability had no impact on the relatively impersonal problemsolving task, alcohol availability led alcoholic couples to increase their expressions of negative affect during the more personally relevant conflict. There was no impact of alcohol on control couples. Subsequently, Jacob and Krahn (1987) replicated this study with a larger sample size and with the addition of a group in which the husband was depressed. The findings again suggested that alcoholics, but not depressives or controls, responded to the presence of alcohol with an increase in negativity. Subsequent analyses established that the impact of alcohol is different between steady and episodic alcoholics, who displayed characteristics of a more antisocial nature (Jacob and Leonard 1988). Although the sequential processes of alcoholics are not differentially influenced by alcohol availability (Jacob and Leonard 1992), preliminary evidence suggests that alcohol may increase the likelihood that episodic alcoholics reciprocate the hostility of their wives but may decrease the likelihood of such reciprocation among steady alcoholics (Leonard 1990).

In sum, although there is a degree of variability across studies, there is tentative evidence to suggest that alcohol exerts a deleterious impact on marital interactions

and that this impact does not extend to depressed or untroubled couples. Alcohol may not be deleterious across all forms of marital interactions; its strongest effect may be in the area of personally relevant conflictual situations, with little or no negative implications for nonconflictual situations or conflict situations of relatively little personal importance. The deleterious impact is not consistent across all alcoholics but rather appears to be of a more coercive nature among episodic alcoholics in the sample, men who, in Jacob and Leonard's (1988) study, also appeared to be somewhat more antisocial generally.

FUTURE DIRECTIONS FOR RESEARCH: THE IMPORTANCE OF THE INTERACTION

Research on the relationship between excessive alcohol use and marital aggression stands today much as it did 5 years ago. There are still few methodologically sound, theoretically sophisticated studies specifically focused on the role of alcohol in marital aggression. Instead, alcohol remains a tangential issue in most studies of marital aggression, relegated to that position perhaps because of the difficulty in moving between drinking patterns and acute effects as easily as one may move between other distal factors and their proximal representations. Or perhaps it is the case that since drinking patterns and acute consumption are clearly neither necessary nor sufficient causes, they are thought to be unimportant contributors. However, it is also the case that none of the other purported causes of marital violence have been clearly demonstrated to be

either necessary or sufficient. Whatever the reason, the research reviewed clearly demonstrates that heavy drinking patterns are strongly related to marital aggression and that this relationship has not been demonstrated to be spurious. Furthermore, the consistent presence of acute alcohol use in violent episodes, ranging roughly from 25 percent to 50 percent depending on the specific sample, while not definitive, is suggestive that the potential impact of alcohol is not negligible.

Given the current state of affairs, one simple recommendation is for more theoretically derived research focused specifically on the role of drinking patterns or acute consumption on marital aggression. However, more precise recommendations can also be offered. At the distal level, such research needs to accomplish two primary goals: (1) determine whether there are specific sociodemographic groups or developmental stages in which the relationship between drinking patterns and marital violence is particularly strong, and (2) establish high-risk background factors that, when combined with heavy drinking patterns, are very strong predictors of marital violence. Although these aims are quite similar, they are worth distinguishing from each other. The first goal focuses on timeframes or subgroups that warrant more intensive study, inasmuch as the operative processes may be more evident at these times or in these people. The goal reflects, to some extent, an economizing approach, directing our research resources at a promising sample rather than an explanatory approach. The second goal is more ori-

ented toward theoretical explanations. By delineating characteristics that, when combined with drinking patterns, predict marital violence, hypotheses concerning the relevant proximal processes may be entertained. For example, the one consistent finding suggesting that hostility (or approval of violence) interacts with drinking patterns to predict violence raises the possibility that, proximally, alcohol consumption enhances the impact of hostility. Of course, the identification of interacting factors distally serves as a preliminary paring of factors that should be studied in conjunction with acute alcohol consumption at the more proximal level.

As valuable as these studies of distal factors are, the key to understanding the impact of alcohol on violence lies in studies at the proximal level, specifically geared toward describing the impact of alcohol on the emergent behavioral interaction and the attendant cognitive processing. There are two general approaches that would be essential in this regard, the study of episodes of naturally occurring marital violence and the experimental study of the impact of alcohol in conjunction with distal and other proximal factors on the processing of maritaly relevant information.

The study of naturally occurring episodes of violence is best exemplified by the recent work of Pernanen (1991). Beginning with a random sample of the community, Pernanen interviewed individuals concerning their most recent experience with violence, either as a victim or as the aggressor. Unlike studies of episodes of violence that come to the attention of the authorities or the treat-

ment community, this methodology may be thought of as producing a random sample of aggressive episodes. The primary strength of this event-based epidemiologic approach is that the distribution of factors involved in the aggression is not distorted by the processes by which an individual or couple comes to be publicly identified as violent. Furthermore, self-presentation biases associated with the public identification process or post hoc interpretations of relational events as a result of a specific treatment philosophy are less likely to occur within a sample drawn from the community, although other biases may be present. By assembling a large sample of marital violence episodes, one should be able to compare self-reports of contextual and interactional factors that characterize episodes occurring with alcohol consumption and episodes that occur without alcohol consumption. This would enable the assessment of specific hypotheses concerning the impact of alcohol in maritally violent episodes, controlling for other contextual features that co-occur with alcohol consumption. Furthermore, by the judicious inclusion of distal variables, the investigator can ensure that any observed differences between alcohol-related episodes and nonalcohol-related episodes are not simply a function of different kinds of individuals being involved in different kinds of contexts. With a large enough sample, the possibility of examining interactions among distal factors, contextual factors, and alcohol consumption in the prediction of physically aggressive versus nonaggressive episodes

or moderately violent versus severely violent episodes becomes possible.

There are, of course, some limitations to this approach. First, it must be recognized from the outset that much of these data are colored by perceptions and appraisals of the violent episodes. Second, inasmuch as at least one, and sometimes both, of the actors in the episodes have been drinking, recollections of the precise unfolding of events may be somewhat hazy. Finally, although studies of other forms of violence almost uniformly have access to only the victim or only the offender, studies of marital violence with this methodology could easily have access to both the offender and the victim. Although these two sources of information are a potential methodological strength, the presence of two accounts virtually ensures that there will be some level of disagreement in the circumstances surrounding a violent episode. Couples often disagree as to whether a violent episode ever occurred. Even if a couple agrees that violence occurred, they may disagree with respect to the frequency that violence occurred, when the violence occurred, which was the most severe episode, and which was the most recent, not to mention the specific details of an episode. Since most interviews are conducted individually with each member of the couple in order to avoid the possibility that the wife would not report violence that had occurred, as well as for precautionary purposes, this creates a situation in which it is difficult to ascertain whether the husband and wife are describing the same or different episodes.

The second approach to studying the impact of alcohol on the interactive process involves studies of the impact of alcohol on actual interactional behavior, as well as the impact of alcohol on the processing of maritally relevant information. As described previously, the study of marital interaction provides a unique avenue to study experimentally the impact of alcohol on marital aggression. In our ongoing research efforts, we have been applying this paradigm to study young married couples who either have or have not experienced marital aggression. The marital interactions of these couples are then observed after the husband has received alcohol, a placebo beverage, or no alcohol. The results of this study, when completed, should provide valuable information on a number of different issues of importance: whether alcohol's effect on marital interaction results primarily from psychological as opposed to psychopharmacological effects of alcohol, whether the effects are seen primarily as changes in the husband's base rates of hostile behaviors or in the husband's reactions to specific wife behavior, and whether the wife alters her interactional style in response to her husband's condition. However, as is apparent in the heuristic model described earlier, these behavioral changes are viewed as being mediated through alcohol's impact on the couple's processing of marital information.

Recently, investigators have applied the social information processing model to the area of marriage and marital violence (Holtzworth-Munroe 1991; McFall 1982). From this perspective, marital

aggression arises as a result of the perception and interpretation of information, the process of response generation and decisionmaking, and the execution of the chosen behavior. Given alcohol's effects on cognitive processes generally, the study of alcohol consumption on marital information processing is a fertile area for future marital research. Indeed, models of the impact of alcohol on behavior (e.g., Steele and Josephs 1988), as well as models of alcohol and aggression (Pernanen 1976; Taylor and Leonard 1983), have long considered the cognitive disruption created by intoxication to be a primary element. However, this perspective has led to only a handful of studies, with none conducted within the marital context.

In sum, the research needs and, therefore, opportunities with respect to the impact of alcohol on marital violence are immense. Such research must be guided by a solid theoretical perspective and shaped by an appreciation of the complex interactional and contextual influences on marital conflict behavior and marital aggression. In particular, there is a need for consistent, programmatic research that spans both the distal and proximal levels of analysis. As a result of the limitations of each of the various methodologies described, it is apparent that advances will be made through the use of convergent methodologies. Given the importance of the emergent interpersonal interaction as a context for violence, this factor, as it is influenced by alcohol consumption, distal and proximal factors, and their statistical interactions, can serve as a major integrative focus for such studies.

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Refining the Brushstrokes in Portraits of Alcohol and Wife Assaults

Glenda Kaufman Kantor¹

Leonard has provided us with a comprehensive analysis, critique, and conceptual synthesis of intoxication and marital aggression research that I do not dispute. Therefore, the intent of this discussion is to amplify and supplement the issues raised by Leonard. Specifically, I will draw from my current research and from my background in sociology and family violence research to expand on Leonard's thinking and to identify methodological, theoretical, and empirical discrepancies that should be considered in future investigations.

A substantial literature now exists establishing alcohol as a major risk factor in family violence (Hotaling and Sugarman 1986; Kantor and Straus 1987, 1989; Kaufman Kantor 1990*a,b*; Leonard 1984; Leonard and Blane 1992; Leonard et al. 1985; Leonard and Jacob 1988). Despite this, we still know surprisingly little about why it has these effects. Much of the social science investigation has tended to paint alcohol-related violence with a broad brushstroke and to accept disinhibition mechanisms as causal without empirically measuring these mechanisms.

Even among family violence researchers, there is little unanimity about the relative importance of alcohol to family violence, and the untested "time-out" explanation as an excuse for alcohol-related marital assaults is often advanced but rarely explicitly tested (e.g., Coleman and Straus 1983; Kantor and Straus 1987). For example, Gelles and Straus' book *Intimate Violence* (1988), on the causes and consequences of family violence, cites this theory but dismisses the alcohol-violence relationship as one of the myths about family violence.

I would be reluctant to summarily dismiss the significance of alcohol to marital violence for two reasons. The first is the constancy with which alcohol emerges as a significant predictor of marital violence. The second is that attributing alcohol's effects on marital aggression to disinhibition understates the complexity of the psychopharmacologic relationship. Researchers employing experimental paradigms in examining the effects of alcohol on aggression have generally demonstrated both direct effects of alcohol on aggres-

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sion and indirect effects mediated by expectancies (Bushman and Cooper 1990; Gustafson 1986; Lang et al. 1975; Pihl et al. 1981; Taylor and Leonard 1983; Zeichner and Pihl 1979). However, as Leonard notes in his critique (this volume), there are wide-ranging estimates about the strength and prevalence of the relationship.

Any lack of empirical consensus on the causal mechanisms, significance, and prevalence of alcohol-related marital violence may be due to failure to take into account interaction patterns that predate the alcohol problem, the developmental stage of the family, variations in drinking stages (periods of sobriety versus periods of intoxication), differences in demand characteristics and experimental conditions, and variations in stressors. Some of these factors may prove to be more relevant to clinical populations of alcoholics studied over several years (e.g., cyclical variations in alcoholism and family adjustment) or studies conducted in laboratory settings (e.g., the demand characteristics of an experimental laboratory on couple behavior). This suggests that the population studied as well as the method of study may influence the results differentially and account substantially for the variability.

POPULATION SUBGROUPS AND VARIABILITY IN ALCOHOL- VIOLENCE OUTCOMES

Leonard notes the finding of high rates of aggression among certain subgroups, such as younger, newly married adults, which could account for variation in violence rates. Interestingly, age, per se, has consistently been a strong and significant predic-

tor of marital violence (Straus et al. 1980; Stets and Straus 1990). Younger families are more violent families. Concurrently, younger individuals tend to drink larger amounts of alcohol. This suggests a need to control for age in examining alcohol-linked marital assaults to avoid drawing spurious conclusions. Researchers controlling for age in such investigations will most likely find an attenuation of alcohol's main effects. But there is also a need to consider whether alcohol-related aggression exists to a greater degree among certain other segments of the marital population, such as among cohabiting couples, clinical populations of violent families, working class families, or particular ethnic groups. This may account to some extent for the variability in rates noted by Leonard as well as myself (Kantor and Straus 1987) and by other research studies conducted in community, clinical, or experimental settings.

Research examining the linkages between alcohol and wife assaults in specific ethnic groups is very rare. Because there are so few studies in this area, and none have specifically measured both structural and cultural aspects of these issues, it has not been possible to disentangle the influences of ethnic culture from the associated stresses of poverty on drinking and intrafamily violence. The study in which I am currently engaged is the first large survey of its kind designed specifically to test hypotheses on the relationship between drinking and family violence in Hispanic families compared to families of other ethnicities.

There are both theoretical and empirical reasons for conducting this study.

The study is theoretically important because few investigations provide information on how wife assaults and intoxication might be associated in Hispanic families. The broader stereotype of machismo drinking, such as the conjunction of heavy drinking and assertion of manliness through physical force, suggests one possible cultural mechanism. An ethic supporting heavy drinking by Hispanic men as an indicator of their masculinity is often assumed to influence Hispanic drinking patterns, but it is also viewed as an inaccurate and pejorative stereotype (Abad and Suarez 1975; Gilbert 1985; Trevino 1975). Additionally, Hispanic families are characterized as being male dominant (Carroll 1980) and having high levels of poverty and unemployment, factors that are consonant with typical predictors of wife abuse.

My analysis of the 1985 National Family Violence Survey (NFVS) (Kaufman Kantor 1990b) provided an empirical basis for pursuing this research. The findings revealed greater prevalence of wife assaults and binge drinking problems among certain ethnic minorities (i.e., African-American and Hispanic-American men). Hispanic-American men were approximately three times as likely as Anglo-American men and almost four times as likely as African-American men to engage in high-volume binge drinking. Additionally, a logit analysis examining the joint effects of poverty, drinking, and ethnicity on wife abuse probabilities for these husbands showed that although overall violence rates by African-American men were generally higher than

those of Anglo-American men, African-American ethnicity was a more significant predictor of wife assaults than drinking when socioeconomic status was controlled. The highest rates of violence by Hispanic-American men occurred for those at poverty level with high-volume binge drinking patterns. The logit analysis comparing Hispanic and Anglo-American husbands also showed that drinking was the only significant predictor of wife abuse when socioeconomic status and race were controlled. This study also demonstrated the importance of considering interaction effects among groups when analyzing alcohol-related marital violence. However, one limitation of this study was its inability to take into account the heterogeneity of Hispanic Americans. Classifying all Hispanic Americans under one rubric could lead to misleading conclusions. Because there are many subgroups, we should expect to find variation between as well as within these groups.

Representative Sample Fallacy

The existence of a representative sample fallacy has been suggested by Room (1980) as one reason for the uncertainty and disparities in estimating the "true" prevalence of alcoholism. High amounts of alcohol intake, per se, although suggestive of drinking problems, cannot be equated with alcoholism. The portrait of alcohol problems in the general population, as painted by survey researchers, is not consistent with that of alcoholics in clinical samples. Straus (1990) has applied this same reasoning to account for discrepancies in wife abuse descriptions

based on clinical populations compared to national probability survey estimates and characterizations of wife assaults. For example, the extent of minor violence relative to that of severe violence is very different in a general population sample compared to a shelter population of battered women. A striking example of this disparity is provided by the statistical records of one battered women's shelter in New Hampshire. Its records show that among women entering the shelter in 1991, one-third reported that weapons were used against them in the violent episode preceding their entry. In contrast to this, the 1985 NFVS reports that weapons were used in fewer than 1 percent of violent episodes.

Each of the sampling strategies generally used to explore alcohol-related marital aggression leaves us with certain nagging questions about the generalizability of our findings to the "real world." Likewise, we might question what constitutes the "real world" and whether the same theoretical propositions hold across differing samples and methodologies. Thus, an important question for researchers is whether the etiology and the processes of alcohol-linked aggression differ for various population types and research samples.

THE IMPORTANCE OF GENDER AND THE DYAD TO THE ALCOHOL-VIOLENCE RELATIONSHIP

It has been suggested that different theoretical models of intrafamily aggression are needed for men and women (O'Leary 1982). This is consistent with gender-

based power differentials in families and in society, and the greater cultural legitimation of violence by men. The symbolic meaning of violent acts may also differ for women. Both women and men may perceive women's acts of physical aggression as more trivial since they are associated with less injurious consequences. Men, in fact, may laugh at their wife's attempts to slap them, and much of the violence by women is in self-defense or retaliation and tends to be less chronic and severe (Miller et al. 1991; Saunders 1986). There is greater normative approval for wives slapping husbands than the reverse, because it is believed that women are less likely to do physical harm than men (Greenblat 1983). However, hitting by the wife may also be interpreted as an expression of hostility or be perceived as threatening or humiliating and can result in retributive aggression by the husband. Aggression by wives has been studied less than that of husbands, and findings of equal rates of violence by wives (Straus et al. 1980; Straus in press) have been regarded as controversial or rejected as invalid (Dobash et al. 1992; Pleck et al. 1977-1978). Further study of the meaning, intent, and context of spousal aggression is needed for both husbands and wives and should be conducted on both national survey and clinical populations.

We also need to determine if the cognitive meaning of alcohol-related violence differs by gender and how women's drinking contributes to their victimization. Recent attribution research, largely based on analog studies of college students,

finds that greater blame accrues to both drunken victims and perpetrators of aggression regardless of gender (Aramburu and Leigh 1991; Dent and Arias 1990). Because drunkenness by the victim can legitimize violence, heavy drinking by wives can increase their risk for marital assaults. Our analysis of substance abuse-victimization effects found that women who abuse alcohol or other drugs are significantly more likely to be victims of marital violence (Kaufman Kantor and Straus 1989). However, the mechanisms underlying this risk have not been well examined. Victimization may occur because women violate gender role norms by being intoxicated, and this can be compounded if women become verbally and physically aggressive while under the influence or if their partners are also intoxicated. Studies of alcoholic women in treatment (Miller et al. 1991) find that these women are more likely to initiate violence against partners than battered women in shelters or women without alcohol problems.

I am very much in agreement with Leonard that we need to consider the drinking patterns of both partners. Many studies on alcohol-related marital violence have failed to do so. It is possible that both the rates and processes of alcohol-related marital assaults can vary depending on whether the wife alone, the husband alone, or both partners are problem drinkers. My analysis of the NFVS shows that families in which the wife is the alcohol-abusing spouse and the husband is the temperate spouse are present in less than 1 percent of the total survey

population (Kaufman Kantor 1992). This is not surprising given the lower prevalence of heavy drinking among women compared to men. However, the rarity of this family typology may also be explained by previous findings that husbands are more likely to leave wives who have drinking problems than are wives to leave drunken husbands. Husbands may also be more likely to assault such wives. Companionate drunkenness is a much more common phenomenon than that where the wife is the sole problem drinker, and this needs to be taken into account in analyses of alcohol-related marital assaults. Previous research (Kantor and Straus 1987, 1989) has shown that women were drinking at the time of marital violence in only 10 percent of families where wife assaults occurred; in 8 percent of the instances, both partners were drinking; in only 2 percent of families, the wife alone was drinking.

There are both methodological and theoretical reasons to consider aspects of the dyad that may contribute to alcohol-related aggression. However, it is also critical that we not overlook certain pitfalls in such an approach. One such pitfall is in attributing blame to the victim, that is, the battered wife. For example, while I concur that drinking by the wife, her verbal aggression, or her violent acts under the influence can trigger or escalate the husband's violence (whether linked to alcohol or not), emphasizing the interactional context of marital violence, and a process of "behavioral escalation" as Leonard mentions, implicitly suggests that the beaten wife contributes to her own victimiza-

tion. It places the wife in the role of the provocateur and perpetuates the stereotype of the nagging, insulting wife as deserving of her own abuse. It suggests that if the wife had only responded differently, coped better, or perhaps ignored or avoided her husband during a drinking bout she would not have been assaulted. We should not lose sight of the fact that violence is a property of the perpetrator's behavior and not of the victim or object of violence. Underscoring this point are research findings about the effects of alcohol on the perception of threat, the channeling of information, and the distortion of cues. Such findings suggest that virtually any response by the wife could be misconstrued by the intoxicated husband as provocative. Finally, emphasizing the wife's role in her victimization flies in the face of the current body of clinical work being done with batterers, that is, having them take responsibility for their own violence.

Methodological Problems in Dyadic Research

Future research on alcohol-related marital violence should ideally be based on reports of both members of the couple. This is quite rare in spouse abuse research due to concerns about the safety of the woman. Certain methodological problems are also inherent in such research and need to be addressed. One such area is how to handle discrepant reporting about drinking and violent behavior, and such discrepancies are to be anticipated. Several studies note gender differences in self-disclosure (women self-disclose more than men). Also, several studies, such

as those by Szinovacz (1983) and Jouriles and O'Leary (1985), indicate that women disclose more violence, both their own and that of their partner, than do men. Additionally, both empirical studies and clinical accounts of abusive men indicate that abusive men minimize or deny the abuse, fail to accept responsibility for the abuse, blame external factors, or project blame onto their partners (i.e., "victim blaming"). These are important factors to consider and resolve when interpreting dyadic reports.

DISTAL AND PROXIMAL CAUSALITY

Leonard has provided us with a comprehensive model and delineated an important conceptual distinction between proximal and distal factors in the modeling of alcohol and marital aggression. However, I would like to emphasize the importance of a path from either the husband or the wife (or both) to the manifestation of physical aggression, one which may not be mediated by alcohol. My own research (Kaufman Kantor 1990a) suggests that models of alcohol-related aggression by either sex must consider the witnessing and experiencing of violence in the family of origin. In this paper examining multigenerational models of drinking and violence, I found significant direct effects of violent socialization (history of violence in the wife's or husband's family of origin) on husband-to-wife violence, net of the effects of drinking. Additionally, I found that violent socialization in the family of origin is correlated with problematic drinking patterns.

Although no measure of intergenerational drinking was available, my finding that problem-level drinking is associated with wife beating suggests that both behavior patterns may have been acquired or influenced by the family of origin. It is also possible that physical abuse or sexual victimization in the childhood of parents increases the risk of their current problem-level drinking. There is a body of research that suggests the association of these factors (Dembo et al. 1989; Miller et al. 1990). A history of alcohol-linked violent socialization is an important etiological consideration (i.e., distal factor) that must be accounted for in all future studies of alcohol-related violence.

LONGITUDINAL VARIATIONS IN ALCOHOL-RELATED MARITAL VIOLENCE

Longitudinal studies of alcohol-violence phenomena are important to our understanding of this process and for assessing behavioral change or constancy. Such investigations need to be conducted for a period of years to avoid hasty or unwarranted conclusions influenced by regression to the mean effects. For example, Feld and Straus' (1990) analysis of the first year followup of the 1985 NFVS concluded that there were high rates of desistance in wife assaults. However, my investigation of these relationships (Kaufman Kantor 1991) among the 772 families followed for all 3 years of the panel study suggests the possibility of a regression to the mean effect. Examination of the frequencies for violent behaviors showed that minor violence patterns fluctuated more

than severe violence patterns for the 3 years of the survey. Minor violence was highest in 1985, decreased considerably in 1986, and increased again in 1987 but at a level slightly less than the initial year of the survey. In contrast, severe violence rates remained relatively stable in the first 2 years of the survey and escalated considerably in 1987. Additional analyses of structural equation models for the 3 years of the survey found a significant and relatively stable positive relationship between cumulative family stressful life events, husbands' drinking, and assaults on wives. This study also found that the strongest longitudinal predictor of wife assaults is the husband's propensity to be violent (as measured by wife assaults in year one of the study). Examining these phenomena longitudinally can give us better insights into how situational factors such as life events intervene to affect alcohol-marital assault relationships.

SUMMARY AND CONCLUSIONS

The methodological and theoretical issues discussed above, as well as those critiqued by Leonard, suggest several areas that should be attended to by researchers in the alcohol-aggression area. Most notable among the methodological issues is the need to attend to variability among population subgroups. Different sampling strategies may be necessary depending on the types of questions to be answered or the prevalence of a phenomenon. For example, questions concerning victimization rates or processes in problem-drinking wives (a low base rate phenomenon) may be better studied by oversampling

women who drink at least moderately or by studying these processes in clinical populations. Similarly, oversampling selected ethnic subgroups or studying these groups cross-culturally may provide unique information on alcohol-marital assault relationships. Other methodological gaps pointed to in the discussion above suggest a need to include both members of intimate dyads as research subjects and to conduct longitudinal research as well.

Researchers should continue to examine whether the etiology and the process of alcohol-linked aggression differ for various research samples or according to the research design (e.g., survey research compared to experimental or naturalistic studies). Using an interdisciplinary framework would be an important first step in resolving the nagging questions that remain. Social scientists are often elated if they explain 25 percent of the variance in any social phenomenon. Incorporating variables representative of different heuristic frameworks could certainly increase our explanatory power. The ability to find one overarching or parsimonious theoretical perspective that adequately explains the complexities of alcohol-linked marital assaults may be a difficult if not futile exercise. The discussion of this paper, and that of Leonard, indicates that multiple paths and multiple factors can lead to aggressive outcomes. We need to refine the broad brushstrokes previously used to paint alcohol and marital assaults.

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Child Abuse and Alcohol Use and Abuse

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INTRODUCTION

Early childhood victimization represents a serious social problem. Estimates are that more than 1 million children in the United States experienced some form of child abuse or neglect in 1986 (Westat 1988). Incidence estimates vary depending on data sources, measurement strategies, definitions of abuse, samples, and methods of aggregating and analyzing data (Besharov 1990; Widom 1988). Thus, our knowledge of the extent of these forms of child maltreatment remains somewhat uncertain and controversial. At the same time, relatively little is known about the causes and consequences of child abuse and neglect.

Even less is known about the connections between child abuse and alcohol abuse. Much of the literature relating alcohol problems and child abuse focuses on parental alcohol use as a risk factor for child abuse. Another stream of recent research calls attention to alcohol problems that may be a consequence of early childhood victimization. This paper begins with a summary of existing work

on the relationship between child abuse and alcohol abuse, dividing studies into those on child abusers (perpetrators) and their alcohol problems and those which address the connection between abused children and their subsequent alcohol problems. There follows a brief discussion of methodological shortcomings in the existing literature. The final section of this paper identifies a number of issues and directions for future research and theoretical consideration.

Although the literature on childhood maltreatment deals with several distinct phenomena, including physical abuse, sexual abuse, neglect, severe physical punishment, and psychological maltreatment, this paper primarily focuses on the first four and only indirectly deals with psychological maltreatment. Although definitions vary by study, creating a problem for interpretation, the following general definitions may be helpful. *Physical abuse* generally refers to incidents of striking, punching, kicking, biting, throwing, or burning a child. *Sexual abuse* covers a wide variety of behaviors from relatively

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nonspecific charges of "assault and battery with intent to gratify sexual desires" to more specific incidents involving fondling and touching, sodomy, and incest. *Neglect* refers to behavior that represents serious omission by parents or caretakers, for example, where there is a failure to provide children with needed food, clothing, shelter, medical attention, and protection from hazardous conditions.

This paper draws on research that utilizes a wide range of indicators for alcohol-related problems, including alcohol abuse and/or dependence, problem drinking, arrests for alcohol problems, and self-reported drinking behavior. Some investigators carefully and explicitly defined their measures of alcohol-related problems (e.g., Parker and Harford 1988), whereas others systematically assess their subjects with one criterion, and yet others rely on simpler assessment measures.

REVIEW OF EXISTING EVIDENCE

Child Abusers and Their Alcohol Problems

Alcohol abuse has often been implicated in explanations of the behavior of abusive parents, and it is not uncommon to find references to the role of alcohol in child abuse. The assumption is that alcoholic parents are at increased risk for maltreating or neglecting their children. A related assumption is that periods of active parental drinking increase the likelihood of child abuse.

A number of possible explanations have been offered for the hypothesized connection. One common explanation

for this connection points to the role of alcohol as a disinhibitor of normal behavioral controls. Another explanation is that abusive parents, in attempting to cope with the stresses of their daily lives, engage in short-term and ultimately self-defeating behaviors involving excessive alcohol use or exceedingly harsh punishment of their children (Wolfe 1987, p. 61). A third possibility is that alcohol may affect interpersonal interactions and expectations about the behavioral effects of alcohol (Collins and Schlenger 1988). Thus, under the influence of alcohol, individuals who may already be stressed may misinterpret cues and resort to abusive interpersonal interactions. A final explanation characterizes alcohol use as an excuse or disavowal technique rather than as a real cause of abusive behavior (Coleman and Straus 1983; Gelles 1972; McCaghy 1968).

The majority of early studies on child abuse and alcoholism focused on parents' behavior, noting the cooccurrence of child abuse and alcohol problems in families. For example, in his large-scale study of physical child abuse, Gil (1973) found that alcoholic intoxication of the perpetrator at the time of the abusive act occurred in about 13 percent of the cases. Young (1964) reported that parental alcoholism was one of the most serious problems in abusive and neglectful families in his Midwest sample. Of the 300 abusive and neglectful families, 186 (62 percent) parents were "severe and chronic drinkers" (p. 71). In a study by the Denver Department of Social Welfare, one-quarter of the fathers of 101 children injured by their parents or caretakers were

believed to be excessive drinkers (Johnson and Morse 1968). Behling (1979) described a study of 51 cases of child abuse at a naval base in which a *Diagnostic and Statistical Manual, Third Edition* (DSM-III) type diagnosis for alcoholism was utilized. About 70 percent ($n = 35$) of the cases of child abuse had at least one parent with alcoholism in the family.

In a review of the literature on alcohol and child abuse, Hamilton and Collins (1982) concluded that the results were contradictory, with some studies finding a relationship and others not. Another review published at about the same time was even more pessimistic. Orme and Rimmer (1981, p. 273) found "no empirical data to support an association between alcoholism and child abuse." When estimates of alcoholism and alcohol problems in the general population were available, the prevalence appeared to be almost identical to that in child abusers.

Studies appearing after these two critical reviews have generally utilized improved methodologies. Using structured interviews, Kaplan et al. (1983) studied 76 parents of abused and neglected children who had been referred for psychiatric treatment for a child abuse and neglect treatment program. These abusive parents were compared with a group of 38 parents of nonabused/non-neglected children who were pediatric outpatients in the same hospital. Kaplan et al. found a higher percentage of the parents of abused and neglected children were given a diagnosis of alcoholism than control parents (25 percent versus 5 percent). Parents of the abused and neglect-

ed children were also more likely to be given diagnoses of antisocial and labile personality. Interestingly, parents of abused children (23 percent) did not differ significantly from parents of neglected children (30 percent) in the proportion who were diagnosed as alcoholic.

In a study of psychiatric illness and physical and sexual abuse, Carmen et al. (1984) noted that one significant family characteristic of the abused patients was the excessive use of alcohol by parents. About 30 percent of the abused patients had alcoholic fathers, compared with 13 percent of nonabused patients.

Ferrier et al. (1985) studied children admitted to a pediatric inpatient service during the years 1974 through 1983 because of child abuse and neglect. The children were under 10 years of age at the time of their admission and had clearcut signs of physical abuse. In 1984, records were examined in the context of a followup. After review of the 34 case records, it was found that alcohol or drug addiction was noted in 6 families (17.6 percent).

Famularo et al. (1986) found a significant overrepresentation of alcoholism (38 percent) in a maltreating parent population (mothers and fathers who had lost custody of their children by court order because of abuse and neglect) compared to parents of children (8 percent) who were inpatients in a general pediatric hospital. The two groups of parents were matched with respect to age, income, race, and marital status. Approximately half of both sets of families were receiving aid to dependent families. Despite a number of important strengths of this research design (the inclu-

sion of a matched control group), these authors noted two limitations of their study that may have affected the incidence of reported alcoholism in their groups. First, the fact that the control group members were voluntary participants made it likely that those who chose not to participate might have had more alcohol problems. Second, the amount of alcohol problems among the court cases may have been an underestimate because of the reluctance of these parents to present a worse picture of themselves during the processing of their custody cases.

Jacobson and Richardson (1987) studied a group of 100 psychiatric inpatients and found that 81 percent of the sample reported being physically or sexually assaulted. More than half (51 percent) of these patients reported alcohol or drug use by the assailant.

Using data from a prospective Danish perinatal birth cohort study of alcoholism, Pollock et al. (1990) examined the role of paternal alcoholism and a history of childhood victimization in antisocial behavior in young adult males. The sample was composed of 131 sons of alcoholic fathers and 70 comparison subjects who were 18 to 21 years old at the time of the followup study. Searches were made of official registries to confirm that the families of control subjects did not have histories of alcoholism or psychiatric hospitalization. Interestingly, although slightly more of the sons of alcoholic fathers than comparison subjects reported that they had been physically beaten (18 percent versus 11 percent, respectively), this difference was not significant.

Whipple and Webster-Stratton (1991) studied 123 families recruited from a parenting clinic specializing in treatment programs for conduct problem children. Parents were defined as physically abusive based on their own or an independent report of child protection services involvement due to child abuse. Twenty-nine families reported that they had been involved in child protection services. Abusive parents were more likely to report an alcohol history than nonabusive parents (45 percent versus 25 percent of the fathers, 3 percent versus 2 percent of the mothers).

Finally, a number of other reports have suggested that incest perpetrators are likely to be alcoholics and/or drinking at the time of their offenses. Estimates of alcohol use among sexual abusers of children range from 35 percent to 85 percent (Browning and Boatman 1977; Cavallin 1966; Faller 1988; Maisch 1972; Vera et al. 1980). In a recent study of female incest victims, Carson et al. (1988) found support for an association between alcoholic family of origin and incestuous victimization. However, the association was only for victims who were themselves alcoholic.

In sum, despite the fact that parental alcoholism has been associated with child abuse in a number of reports, the literature does not present a consistent picture. Despite the fact that some of the more recent research has utilized increasingly sophisticated research designs, methodological problems continue to limit the generalizability of these findings. In studies of maltreating parents, estimates of the extent of alcoholism range from 18 percent to 38 percent. In studies of abused

psychiatric patients, reports of parental alcoholism and alcohol abuse ranged from 30 percent to 51 percent. Only one study offers strong evidence for a connection between child abuse and alcohol abuse (Famularo et al. 1986). One prospective study comparing sons of alcoholic fathers with a matched group of sons without alcoholic fathers found no significant differences in the extent of childhood physical abuse (Pollock et al. 1990). Unfortunately, after reviewing this more recent literature, the conclusion to be drawn does not appear noticeably different from that of Hamilton and Collins (1982) and Orme and Rimmer (1981).

Childhood Physical and Sexual Abuse as Risk Factors for Subsequent Alcohol Problems

Child abuse and alcohol abuse may also be connected through a relationship between childhood victimization and increased risk for subsequent alcohol problems. Early onset and heavy use of alcohol may represent a coping strategy used by abused and neglected children to help them adapt to their early childhood trauma and to distance themselves from the painful realities they experienced. Child abuse and neglect may also lead to lowered self-esteem which, in turn, may lead to the development of destructive patterns of coping, such as alcohol abuse (Miller et al. 1989). Thus, for victimized children, alcohol use may serve a number of possible functions: (1) as an emotional and/or psychological escape from an abusive and aversive environment, (2) as a form of self-medication in which the child

tries to gain control over his or her negative life experiences, (3) as a form of self-enhancement to improve the child's self-esteem, or (4) to reduce feelings of isolation and loneliness (Widom, in press).

Despite these plausible explanations for a hypothesized association between childhood victimization and subsequent alcohol problems, relatively few studies have examined alcohol problems in adolescents or adults who were abused and/or neglected in childhood. Existing studies consist primarily of work with specialized populations of female and male alcoholics or psychiatric inpatients. Few studies have looked at the connection between childhood victims and alcohol abuse in nonclinical samples. Typically, these studies have examined a history of child maltreatment and alcohol problems in specialized adult samples.

Adult alcoholics

Haver (1987, p. 451) noted that half of a sample of 44 *female* alcoholic subjects reported that violence occurred either between their parents or between a parent and the subject. Miller et al. (1987) found that alcoholic women were more likely to report having experienced sexual abuse as compared to the women in the nonalcoholic group, even after controlling for demographic variables and the presence of a parent with alcohol-related problems. Downs et al. (1987) found that significant differences in subsequent alcohol abuse by women were associated with childhood experiences of familial violence (specifically father to daughter), after controlling for demographic characteristics and

parental alcoholism. Miller et al. (1989) reported that paternal total violence and specific forms of delinquency (stealing) were significantly related to alcohol abuse in women. It is interesting that, in contrast to the findings of earlier work (Miller et al. 1987), childhood sexual abuse appeared to have no direct impact on the development of alcoholism in later life.²

Other studies have looked at a history of child maltreatment and subsequent adult alcohol problems in *males*. For example, Kroll et al. (1985) reviewed the charts of 411 patients on the Alcohol Treatment Unit at the Ann Arbor Veterans Administration Hospital between 1978 and 1981. Of these patients, 13 percent (53) met the authors' operational definition of child abuse (defined as repetitive, physically injurious punishment, i.e., punishment that drew blood, left scars, or rendered the child unable to go to school). A control group was composed of every third patient who entered the program and who was free of the exclusionary symptoms.³ Abused alcoholic men demonstrated significantly more legal difficulties, domestic violence, and violence against authority figures than control males (alcoholics without a history of abuse). These men also had higher incidences of serious suicide attempts, suicidal drinking, and increased levels of pervasive and situational anxiety.

Schaefer et al. (1988) studied the prevalence of childhood physical abuse in 100 adult male veterans seeking inpatient treatment for alcoholism. In this sample, 31 percent reported that they had been repeatedly physically abused as a child. Those who reported abuse had scores on the SCL-90 indicating more severe psychological problems and associated levels of psychological distress than the nonabused alcoholics. However, the groups did not differ in age of onset, severity, or treatment history for alcohol dependence.

In sum, studies of adult *female* alcoholics suggest a higher incidence of child abuse, but there are inconsistencies across the existing studies, and the findings are based on retrospective reports. Differences in subsequent alcohol abuse among female alcoholics were found to be associated with family violence. In two studies with males, estimates of the extent of physical child abuse range from 13 to 31 percent. Abused alcoholic males also showed more problems in general.

Adult psychiatric inpatients

Some studies have reported alcohol use and/or abuse as part of psychiatric diagnoses in samples of abused and nonabused general adult psychiatric inpatients. For example, Carmen et al. (1984) studied the relationship between physical and sexual abuse and psychiatric illness in 188 male and female psychiatric patients

² In these analyses, childhood sexual abuse is highly correlated with delinquency. When the delinquency variable is added to the predictive equations, childhood sexual abuse no longer contributes uniquely to the variance. Personal communication, Brenda Miller, May 1992).

³ Patients who were excluded from the initial group of 52 for a number of reasons including epileptic seizures, diagnosis of major affective (4) or schizophrenic (2) illness, and antisocial personality with

through examination of psychiatric inpatient records. Overall, 43 percent of the sample reported sexual or physical abuse. (Interestingly, nonabused patients reported a higher percentage with a history of alcohol abuse than did abused patients (35 percent versus 21 percent, respectively.)

Bryer et al. (1987) examined 66 female psychiatric inpatients, ages 18 to 64, who were free of organic dysfunction and toxic reactions to drugs and alcohol. Histories of early and later abuse were identified by responses to questions during a self-administered questionnaire. Twenty-one percent of the women reported sexual abuse only, 18 percent reported physical abuse only, and 33 percent reported both types of abuse. Using the Millon Clinical Multiaxial Inventory Scores as an index of alcohol abuse, there were no significant differences among the groups. However, the mixed sexual and physical abuse group had somewhat higher scores than inpatients who reported no abuse and those who reported sexual abuse only. In a multiple regression analysis predicting global severity index, the only significant predictors of severity score were early sexual abuse, father's alcohol abuse, and early physical abuse.

Brown and Anderson (1991) explored childhood sexual and physical abuse in more than 1,040 consecutive admissions to an adult psychiatric inpatient unit. Of the 947 patients included in the analysis, the prevalence of reported childhood abuse was 18 percent overall (9 percent for sexual abuse, 10 percent for physical abuse, and 3 percent for combined abuse). Alcohol use disorders were more common

in victims of combined (43 percent) or physical (28 percent) abuse than in the sexually abused (17 percent) or nonabused patients (21 percent). Patients with a history of physical abuse (although not sexual abuse) also had a higher prevalence of past alcohol use disorders (50 percent) than patients who had not been physically abused (32 percent). Combined abuse in women and physical abuse in men were associated with a family history of psychiatric illness, most commonly alcoholism in male relatives.

In sum, two of these studies with adult psychiatric patients did not find support for a connection between child abuse and subsequent alcohol abuse. One study found that the nonabused patients had higher rates of alcohol problems (Carmen et al. 1984) and another found no differences (Bryer et al. 1987).

Sexual assault and alcohol problems

Other studies have assessed alcohol abuse in samples of individuals who have been sexually assaulted. For example, Frank et al. (1981) reported that 29 percent of a sample of sexually assaulted adult women had abused or were currently abusing alcohol. Peters (1984) studied 119 women randomly sampled from Los Angeles community households and found childhood assault to be associated with indicators of adult alcohol abuse.

In a cross-sectional probability survey of 3,312 adults sampled from the household population of one or more mental health catchment areas in two Los Angeles communities (Burnam et al. 1988), lifetime diagnoses of mental disorders for

individuals who reported that they had been sexually assaulted at some time in their lives were compared to those for individuals who reported no sexual assault. Using the full household sample, lifetime prevalence rates for alcohol abuse and/or dependence among sexually assaulted and nonassaulted individuals did *not* differ significantly (18.4 percent versus 13.8 percent). To control for demographic variables that might have confounded the relationship between sexual assault and mental disorder, each person who reported sexual assault was paired with a nonassaulted individual of similar demographic characteristics. Among these matched sexually assaulted and nonassaulted groups, the sexually assaulted group was significantly more likely than the nonassaulted group to have reported a history of alcohol abuse and/or dependence (4.9 percent versus 2.8 percent, respectively, with onset before the assault incident). Alcohol abuse and/or dependence was more highly related to assault as a consequence than as a precursor, and age at which the first sexual assault occurred was an important predictor of later disorder. That is, those individuals who reported being assaulted in childhood (15 years of age or younger) were more likely to report subsequent development of alcohol abuse or dependence than those first assaulted in adulthood (age 16 year or older).

The findings of the Burnam et al. (1999) study are particularly important in view of the strengths of this study, which included (1) an examination of these relationships in a large sample representing an

adult household population, (2) assessment of specific mental disorders using a structured diagnostic interview, and (3) inclusion of males in the sample. Unfortunately, these findings are based on retrospective self-report information and suffer the limitations associated with such a design.

Followup studies

There are a few longitudinal studies that address the temporal relationship between child abuse and alcohol abuse. It is interesting that, in both studies reviewed here, physical abuse was not associated with increased risk of subsequent alcohol abuse. In her 40-year longitudinal followup study of Cambridge-Somerville boys, McCord (1983) concluded that "apparently the antisocial impact from parental abuse, neglect, and rejection is largely reflected in juvenile delinquency" (p. 268), and that the groups did not differ reliably in proportions of men who had become alcoholics.

Recently, Dembo et al. (1990) examined the relationship between alcohol use and emotional/psychological functioning in a cohort of high-risk youth (detained juveniles approximately 16 years old at first testing). Using structural equation modeling to test a number of hypothesized effects, Dembo and his colleagues found that physical abuse was significantly related to alcohol use prior to the initial interview. However, neither physical abuse nor sexual victimization was associated with the use of alcohol during the followup period about 1 year later.

In a recent report of a followup of individuals who were severely battered as

young children, Martin and Elmer (1992) were able to locate and interview 19 of the original 33 subjects as adults (ages 25 to 36 years old). In response to a series of questions about substance abuse, only three of the subjects admitted a current drinking problem, and two additional respondents admitted a past problem. The authors suggested that the subjects were reluctant to discuss the topic and that "the actual extent of the problem was probably not revealed" (p. 81). However, 26 percent of these individuals admitted past or present drinking problems. Of the five respondents who admitted to drinking problems, three had been mistreated by parents who were frequent and heavy drinkers, whereas the other two had no known family history of problem drinking.

Findings from these followup studies do not provide strong support for a connection between child abuse and subsequent alcohol abuse. In a recent review, Beitchman et al. (1992, p.115) described the long-term effects of childhood sexual abuse that they believed were supported by some degree of empirical evidence. Of the common outcomes identified, alcohol abuse and/or problems were *not* mentioned at all by women who reported a history of childhood sexual abuse in comparison to women who did not report a history of childhood sexual abuse.

Most of the studies have sampled from alcoholics or psychiatric inpatients. Few studies have used more representative samples. Reliance on such samples restricts the generalizability of these findings since many childhood victims do not

seek later treatment or professional services. Those who use such services may have higher rates of alcohol-related problems than those who do not seek treatment, leading to an overestimation of alcohol-related problems among childhood victims.

METHODOLOGICAL CONSIDERATIONS

While clinical and other evidence suggests a connection between childhood victimization and alcohol abuse, the relationship is tentative. Our current knowledge is in a very early developmental stage, limited in quantity and type, compromised by methodological problems, almost exclusively limited to bivariate associations, and often fraught with conflicting findings. Methodological limitations in the existing research make interpretation of some findings ambiguous.

The first problem is that most research is primarily correlational in nature, with data collected at one point in time. Correlational studies do not generally permit examination of causal sequences, and this introduces ambiguity into the interpretation of the temporal nature of the events. While there is an assumption that childhood victimization leads to subsequent alcohol abuse or alcohol-related problems, it is possible that a relationship between childhood victimization and alcohol abuse exists but may not be causal.

Second, many studies depend on retrospective accounts of childhood victimization. The term "retrospective" refers to the collection of information after the event, and it is used here to call attention

to the potential risk of distortion, inaccuracy, and loss of information that may result from recalling events from a prior time period. Retrospective data are notoriously unreliable (Yarrow et al. 1970). For example, descriptions of the incidence of certain phenomena have been found to differ depending on whether self-reports are made in the context of retrospective or prospective studies (Koeske 1981; Sommer 1978). Thus, studies based on retrospective accounts of childhood experiences may be open to a number of potential biases (Widom 1988). For example, if asked to recall early childhood events, it is possible that respondents forget or redefine their behaviors in accord with later life circumstances and their current situation (cf. Carson et al. 1988). It is also possible that a person might redefine someone else's behavior in light of current knowledge. Furthermore, unconscious denial (or repression of traumatic events in childhood) may be at work in preventing the recollection of severe cases of childhood abuse.

Third, there is often a lack of appropriate comparison or control groups. Since much childhood victimization occurs in the context of multiproblem homes, alcohol-related problems may be only one of the family's problems. There is some consensus that child maltreatment occurs disproportionately more often among economically and socially disadvantaged families (National Center on Child Abuse and Neglect 1981; Pelton 1978). Compared to all families with children in the United States, maltreated children are twice as likely to live in

single-parent, female-headed households; four times as likely to be supported by public assistance; and more likely to live in families having health problems, alcohol abuse, and wife battering (American Humane Association 1984). The same pattern was found in the more recent survey. Children from larger families (i.e., those with four or more children) and from families earning less than \$15,000 in 1986 were more likely than those from higher income families to experience maltreatment and injury (Westat 1988). Thus, in examining the subsequent risk for alcohol problems for abused and neglected children, the general effects of other family variables, such as poverty, unemployment, parental alcoholism or drug problems, or other inadequate social and family functioning, need to be disentangled from the specific effects of childhood abuse or neglect.

Control groups matched on socioeconomic status and other relevant variables are necessary to determine the effect of childhood victimization on later behavior, *independent* of correlated family and demographic characteristics. Referring to the lack of appropriate comparison or control groups as perhaps the most serious methodological problem in the field of child sexual abuse, Beitchman et al. (1991) commented that "the literature has been vague in separating effects directly attributable to sexual abuse from effects that may be due to preexisting psychopathology in the child, family dysfunction, or to the stress associated with disclosure" (p. 538). Furthermore, they argued that "inclusion of both normal

nonabused controls as well as a control group of psychologically disturbed individuals (e.g., physically abused children) is required to best test for specificity effects" (p.552).

The fourth problem is that, until very recently, few studies have used methods of clinical assessment and diagnostic criteria that permit the examination of multiple diagnoses. The interrelationship between alcohol-related problem behavior outcomes and other symptoms of psychiatric dysfunction in abused and neglected children has not been adequately examined. Consideration of a range of problem behaviors among individuals with alcohol problems is critical, since the prevalence of multiple diagnoses among alcoholics hospitalized for treatment is high (Beck et al. 1976; Hesselbrock et al. 1988; Whitters et al. 1985). While intoxicated, alcoholics often attempt destructive behavior, including suicide attempts (Schuckit 1986). The diagnosis of alcohol abuse is also complicated by the presence of antisocial personality disorder, and alcohol intoxication at an early age is part of the diagnosis for antisocial personality disorder.

Awareness of these methodological limitations is important. However, the study of childhood victimization has been developing rapidly, and there is a clear trend toward more sophisticated research designs with large sample sizes, carefully defined abuse and neglect cases, incorporation of matched control groups, and sensitivity to the limitations of designs based exclusively on retrospective self-reports.

ISSUES FOR FUTURE RESEARCH AND THEORETICAL CONSIDERATION

The Social Context: The Family

Child abusers often have more than one problem. In many studies, abusers are treated as if they have a single problem. This is particularly unfortunate since families in which abuse occurs often have multiple problems. For example, in the Brown and Anderson (1991) study, many abused patients came from families with psychiatric illness, of which alcohol problems were most common. When two disorders or dysfunctional behaviors are associated, the one that occurs first might be the risk factor for the other. Here as well as in assessing risk for child abuse, it is important to establish which came first.

Another critical problem is that studies often fail to take into account a family history of alcohol problems. In general, children of parents with alcohol problems are at increased risk for the development of alcohol problems. In fact, a recent article (Pickens et al. 1991) begins with the assertion that "a positive family history is one of the most powerful predictors of alcoholism risk" (p. 19). Offspring of alcoholics are about five times more likely to develop alcohol-related problems than offspring of nonalcoholics (Midanik 1983; Winokur and Clayton 1968). There is, however, considerable controversy regarding the extent to which these patterns are due to genetic or environmental influences.

Goodwin et al. (1973) found that adopted-away male offspring of Danish alcoholics were four times more likely to

be alcoholic than adoptees of nonalcoholic controls. In an American sample, Cadoret et al. (1980) found that biological background of alcoholism predicts risk of DSM-III-based diagnoses of alcohol abuse and dependence in male and female adopted-away offspring. In a cross-fostering analysis of Swedish male adoptees, Cloninger et al. (1981, 1985) found genetic influence to be related to severity of alcoholism. Both parental alcohol abuse and adoptees' environment contributed to susceptibility to alcoholism of adult children. Using data from a 1979 household survey of men and women in the United States, Parker and Harford (1988) found that having parents who have been alcohol abusers places sons at risk for dependent problem drinking, and daughters at risk for depressive symptomatology.

While some evidence suggests that childhood victims may be vulnerable to subsequent alcohol problems, none of these studies of familial transmission has involved child abuse. Studying this relationship is difficult, however, since much abuse that occurs is committed by biological parents and in the context of multiple problem homes. The research by Kroll et al. (1985) with a sample of adult alcoholic men illustrates the complexity of studying the relationship between childhood victimization and later alcohol problems. These researchers found that the abusing parent in the childhood of the abused men was almost always the natural father (90 percent) who frequently was alcoholic (83 percent). This potential confound needs to be addressed in future research. Given that there appears to be

some familial basis for alcoholism, research will need to disentangle the effects of a genetic predisposition from the effects of an abusive or neglectful home environment. In some ways, there may be similarities between growing up in abusive households and in alcohol problem families in that some children in both situations develop survivor defenses and are more likely to have personal, school, and legal problems than children growing up in nonabusive households (Brown 1988; Straus and Gelles 1990). Earls et al. (1988) found that the prevalence of certain childhood psychiatric disorders (attention-deficit disorder with hyperactivity, oppositional disorder, and conduct disorder) was higher in children of alcoholic parents than in children of nonalcoholic parents. Thus, information on parental alcohol problems needs to be incorporated in future attempts to understand the relationship between child abuse and risk for later alcohol problem behaviors.

When parents who abuse their children also have alcohol problems, is the effect of the abuse more severe on the children? Sirles et al. (1989) examined information from 207 children and their families who were receiving services as part of an intrafamily child sexual abuse program between 1982 and 1986. Child sexual abuse victims were a mean of 10 years of age (range 2 to 17) and were predominantly female (82 percent). Perpetrators were overwhelmingly male (only two were female). One of the characteristics distinguishing children diagnosed with a clinical syndrome ($n = 79$) from those who did not have a condition attributable to a mental

disorder ($n = 128$) was whether the child was sexually abused by an offender who had a history of alcohol abuse. Children abused by an offender with a history of alcohol abuse were more likely to be diagnosed with a clinical syndrome than those without. Half the cases involving alcohol abuse in the home had a diagnosis in comparison to 27 percent of the cases that did not involve alcohol abuse. This variable remained significant (one of only two) throughout regression analyses.

Future research needs to consider the role of other family variables, such as marital conflict, since these may have an effect on the child's response to the abuse and ultimately to the long-term consequences. For example, heavy or abusive use of alcohol can generate stress, including job difficulties, family and marital difficulties, and legal and medical problems (Brown 1988). In addition, the child's interpretation of the experience may also be important.

Cultural and Ethnic Differences

Korbin (1980) has called attention to the importance of culture in defining and understanding child abuse. At least one report examined the profiles of Chinese American, Native Indian, and Anglo-Canadian children and abusers and indicated that there might be important cultural differences (Leung and Carter 1983). During a 5-year period, 340 children and their families were referred for medical care and seen by the child abuse team for assessment and treatment. Of these, 20 Native Indian children, 46 Anglo-Canadian children, and 12 Chinese chil-

dren were assessed. According to the authors, alcohol played no role in the cases of the Chinese children, whereas 50 percent of the cases in the Indian group were alcohol related. Of these, four children showed evidence of fetal alcohol syndrome. For the Native Indian children, the abusers were male and female parental figures with alcohol problems and family neglect as major features. If these findings were to be replicated in future research, then the implications are that treatment, prevention, and intervention programs would benefit from being culturally and ethnically sensitive. For certain families who may be at high risk for alcohol problems, a focus on alcohol problems might be most useful, in addition to more general programs on parent training and child abuse prevention.

The purpose of this brief discussion has been to call attention to the need to consider cultural and ethnic differences. Numerous questions remain unanswered. To what extent do different cultures or ethnic groups have different rates of child abuse? How reliable is this information? How do differences in rates of alcohol abuse and/or use among groups interact with rates of child abuse? To what extent are these possible connections a function of a third variable, such as poverty, unemployment, or stress? Answers to these questions remain for future research.

Chronic Versus Acute Effects of Alcohol on Child Abuse

Assuming that there is a connection between alcohol abuse and child abuse, it is important to know whether the relationship is a function of the alcohol intoxica-

tion (an immediate effect) or effects associated with chronic alcohol abuse. For example, in his study of physical child abuse, Gil (1973) found that there was a fair amount of alcoholic intoxication of the perpetrator at the time of the abusive act. If it were found that during periods of drinking, parents showed increased abusive behavior, decreased attention to a child's basic needs, decreased job performance, lowered income, increased stress, and increased family and marital discord, then these findings would have certain implications for the development of intervention programs. Implications for interventions would be different, however, if it were established that the connection was due to the effect of chronic alcohol abuse. If it were found that the relationship was part of a broader deviant/antisocial/risk-taking lifestyle, rather than a consequence of a chronic and debilitating pattern of alcohol abuse, different intervention strategies might be warranted. The only evidence to bear on this question is from a study by Reider et al. (1989) which found that parents' long-term alcohol involvement was associated with the use of physical aggression against their children, but level of alcohol consumption was not a predictor.

Some research has reported an association between drinking and other forms of violence. For example, studies have reported that incarcerated inmates have high rates of daily drinking and drinking prior to their incarceration offense (Kalish 1983). In a more recent study involving data from 1,149 convicted male felons, Collins and Schlenger (1988) examined the effects of acute alcohol use (drinking

just before the violent event) and chronic alcohol use (a psychiatric diagnosis of alcohol abuse or dependence) on violence. Acute effects of alcohol use were significantly associated with incarceration for a violent offense, although the net explanatory power of those effects was rather small. It is interesting that chronic alcohol effects were not significant. Collins and Schlenger suggested that it is the proximal effect of alcohol use, rather than the characteristics associated with chronic alcoholism, that is associated with the likelihood of violence. An analysis similar to that of Collins and Schlenger is recommended to examine the relationship between child abuse and acute versus chronic alcohol abuse.

Comorbidity or Cooccurrence of Problem Behaviors

One of the difficulties in assessing subsequent risk for alcohol use and/or abuse in abused and neglected children is the co-occurrence of other problems (comorbidity) in these children. Since childhood victims appear at high risk for the subsequent development of a variety of problem behaviors, some discussion of the cooccurrence of these problems may be useful for future research. Diagnoses of alcoholism are complicated by the presence of antisocial personality disorder and drug abuse and/or dependence (Robins and Regier 1991). The cooccurrence of alcoholism, antisocial personality disorder, and substance abuse has been noted among male jail detainees (Abram 1990). Other literature indicates that alcoholics often attempt destructive behaviors,

including suicide attempts (Schuckit 1986). Finally, higher rates of depression have been noted in physically abused children (Allen and Tarnowski 1989). Engaging in any of these behaviors might also increase the risk for drinking problems. Unfortunately, few studies of abused and neglected children have used methods of assessment and diagnostic criteria that permit simultaneous examination of multiple characteristics and consequences.

A number of studies call attention to the need for careful inquiry into alcohol abuse when a history of childhood victimization is revealed and for inquiry about possible childhood victimization when alcohol abuse is present (Jacobson and Richardson 1987). Rose (1991) also suggested that there is a need to identify and respond to children in alcoholic homes if the probability of child sexual and physical abuse is elevated, since these factors may contribute to heavy use of mental health services.

Generalized or Specific Risk for Alcohol-Related Problems

A related issue is whether childhood victims are at generalized risk for the development of a range of subsequent problem behaviors (one of which is alcoholism) or whether child victims are at specific risk for alcohol problems. Early childhood victimization may increase risk for any of the behaviors often subsumed under what has been labeled the *syndrome of problem behaviors*. That is, some researchers believe that various manifestations of problem behaviors should be considered in terms of

a single underlying tendency, often referred to as a "problem behavior syndrome" (Jessor 1987; Kaplan 1980; Robins 1978; Robins and Wish 1977). Others believe that different sets of problem behaviors represent fundamentally different etiologies (Elliott et al. 1989; Kandel and Andrews 1987; McCord 1990). If there is a syndrome of problem behaviors, and abused and neglected children are at increased generalized risk, then it is more likely that they will engage in many of these forms of problem behaviors (alcohol among them). On the other hand, if problem behaviors represent discrete behaviors with different etiologies, then the consequences of childhood victimization may be confined to more limited domains of dysfunction (alcohol problems may or may not be included). These contrasting models also have different implications for intervention strategies. Researchers who emphasize the syndrome believe that reducing problem behaviors depends on prevention or intervention to influence a common underlying trait. If specific problem behaviors represent specific etiologies, then a single strategy might fail to reduce the problems of most individuals. Studies are needed with sample sizes large enough to examine a number of possible outcomes, while simultaneously controlling for relevant demographic characteristics.

Type of Abuse and Risk for Subsequent Alcohol Problems

To what extent is the connection between child abuse and alcohol abuse specific to types of abuse? A number of studies describing alcohol-related problem behav-

ior have been in the context of research on sexual abuse (Burnam et al. 1988; Frank et al. 1981; Peters 1984). In general, these studies have not found relationships between childhood victimization and later alcohol problems. Unfortunately, few published studies exist that compare consequences across types of abuse and/or neglect. Most studies focus exclusively on one type of abuse (physical abuse or sexual abuse). Rarely do studies include separate groups of neglected individuals, despite the fact that there is evidence to support the importance of doing so (Bousha and Twentyman 1984; Widom 1989*a, b*). Methodologically and conceptually, however, it is more difficult and complex to examine multiple types of abuse.

Gender, Child Abuse, and Alcohol Abuse

The connection between child abuse and alcohol abuse is further complicated by the issue of gender. To what extent are males and females at differential risk for subsequent development of alcohol problem behaviors? Specifically, there is evidence that there may be sex differences in (1) familial transmission of alcoholism, (2) risk of becoming alcoholic, (3) type of abuse experienced, and (4) willingness to report. All of these factors make research on this topic challenging.

Familial transmission

The effects of parental alcohol abuse appear to differ depending on the gender of the child (Goodwin et al. 1973, 1977). Using data from a 1979 household survey of men and women in the United States, Parker

and Harford (1988) found that having alcoholic parents places sons at risk for dependent problem drinking and daughters at risk for depressive symptomatology (controlling for sociodemographic characteristics of the adult sons and daughters of alcoholics). In a recent study of the inheritance of alcoholism in male and female twins, Pickens et al. (1991) found sex differences in overall level of concordance for alcohol diagnosis, with males having higher concordance rates than females. These studies do not address the increased risk of familial transmission associated with assortative mating, which needs to be considered as well (Hall et al. 1983; Robins 1966).

Risk for alcoholism

According to the recent Epidemiological Catchment Area survey data (Robins and Regier 1991), the lifetime alcoholism rate for males is 23.8 percent, while for females it is much lower (4.6 percent). Thus the male-female ratio of alcoholism is approximately 5 to 1 and clearly, females are at much lower risk for alcoholism than males, although there is some evidence of convergence in rates between the sexes in young age groups (Robins and Regier 1991, p. 89). A similar pattern was noted in Sweden. Alcoholism in Sweden in the 1960's was almost exclusively male and virtually unknown in women and children. However, Rydelius (1981) noted that the chance that Swedish children from alcoholic families can have both an alcoholic father and mother has increased, since alcoholism in women in the population has expanded considerably over the 20-year period.

In studies that use both males and females as subjects, data on female and male alcoholics should be analyzed separately (Pihl et al. 1990). This would enable further description of sex differences and permit cross-study comparability. This would also remove the possibility that in mixed-sex studies, reporting negative results would not mask true differences among groups. Furthermore, if studies are done involving alcoholic mothers, children should be examined separately. The effects of alcohol on fetal development have been documented, and this maternal characteristic would be an increased risk factor for the child.

Risk by type of abuse

Females are more likely to report histories of sexual abuse than males (Brown and Anderson 1991; Carmen et al. 1984), and more females appear in official records for sexual abuse (Westat 1988). Females experience more abuse than do males, reflecting primarily a greater vulnerability to sexual abuse. According to the Westat (1988) survey, there were 3.9 sexually abused females per 1,000 compared to 1.1 sexually abused males per 1,000. Fewer sex differences are associated with physical abuse or neglect, although some data suggest that somewhat more males than females are physically abused. These incidence estimates are ambiguous, since type of abuse varies by age of individual. Age at the time of abuse incident would need to be factored into analyses across types of abuse and gender.

Unfortunately, very little research has examined consequences for males and females who experienced the same type of

abuse. One notable recent exception is the work of Burnam et al. (1988). Although women reported greater risk for becoming victims of sexual assault in that study, the impact of assault on mental health status did not differ considerably between the sexes. Assaulted males were more likely than assaulted females to report *later* onset of alcohol abuse or dependence, but no gender differences were apparent for any of the other disorders (Burnam et al. 1988).

Willingness to report

Males may be less likely to reveal their childhood sexual assault experiences to therapists than are females (Jacobson and Richardson 1987). Thus, depending on the proportion of males in a study, findings may be influenced by underreporting of childhood abuse. For example, the higher proportion of males in the study by Brown and Anderson (1991) compared to most non-Federal general inpatient settings may lead to higher rates of underreporting if one assumes that males in our society are less likely to report abuse (Nasjlet 1980). Research based on official reports and self-reported information needs to recognize the potential biases and complicating factors represented by the gender of the subjects. In the child abuse and neglect area, more research is needed on the reliability and validity of self-reported information.

Temporal Order

Little is known about the temporal order of the connection between child abuse and alcohol abuse. For example, the experi-

ence of child abuse and/or neglect may lead to lowered self-esteem that, in turn, leads to coping behaviors which might involve alcohol abuse (Miller et al. 1989). Thus, low self-esteem may precede the use (or abuse) of alcohol. On the other hand, alcohol use (or abuse) may serve as an escape for the abused or neglected child and may ultimately have as its consequence the lowering of that child's self-esteem. The research by Burnam et al. (1988) suggests that sexual assault has its strongest connection to later problems when it occurs early in life. That is, an important predictor of vulnerability to disorder after the assault was the age at which the first sexual assault occurred: Those assaulted in childhood were more likely than those first assaulted in adulthood to report later onset of alcohol abuse or dependence, among other disorders.

In his discussion of the connection between alcohol problems and criminality in the children of alcoholic fathers in Sweden, Rydelius (1981) also called attention to the problem of temporal sequencing. To address this issue, he examined the possibility that the proband boys in his sample became afflicted by alcohol problems at an early age and that other problem behaviors, such as criminality, were secondary effects of their alcohol abuse. In the context of his longitudinal study, Rydelius found that there were no age differences between the boys with respect to their onset of registration in official records for alcohol problems (the Temperance Register) or criminality (the Criminal Offenses Register). Juvenile delinquency usually preceded registration

in both registers, suggesting that alcohol was not the antecedent factor. Rydelius also recognized the possibility that the transmission from alcoholic father to alcoholic son may result from some underlying personality variable common to both alcoholism and antisocial behavior. Unfortunately, many studies of abused and neglected children and adolescents do not assess the extent of subsequent alcohol-related problems.

General Recommendations for Future Research

Researchers who want to study the connections between child abuse and alcohol abuse are faced with a number of methodological and conceptual challenges and the need to come up with creative research strategies to overcome them. One possibility is to "piggyback" on already existing longitudinal or followup studies where there is an existing well-designed study population, large sample, clear definitions of abuse and neglect, the ability to follow up on the individuals (names and identifying information available), and the passage of sufficient time. This approach would permit an examination of some of the critical questions regarding the temporal sequence of the hypothesized relationship between child abuse and alcohol abuse. Ongoing studies of family violence might also be extended to include an assessment of alcohol consumption (situational and long term) by family members.

Reliability and validity of data are continually problematic because of the personal nature of abuse and a general reluctance or inability to provide full

information for the investigator. Since many studies are dependent on retrospective self-reports of adults abused in childhood, there is a critical need for validated assessment techniques that can be used retrospectively with some confidence. Knowing the errors and/or biases in retrospective assessment techniques is preferable to the assumption that there is no error or that the error is random.

Future research might consider the use of animal analog studies, which permit control of environments, experimental manipulations, and monitoring of outcomes, which are obviously not possible with humans. In a series of studies with nonhuman primates, Suomi, Higley, and colleagues have shown that differences between peer-only reared monkeys (reared for the first 30 days in neonatal nurseries with or without terry cloth surrogate mothers, a laboratory analog to being neglected or reared without parental figures) and mother-reared monkeys was most dramatic under challenges such as exposure to novel sounds or the appearance of a stranger. Even as adults, peer-only reared monkeys, when exposed to novel situations or social separation, were more likely to show behaviors characteristic of anxiety. Furthermore, under the stressor of a new baby, these at-risk peer-only reared monkeys were more likely to reject or neglect their first offspring (Suomi and Ripp 1983). Peer-reared monkeys showed aggressive behavior and low levels of 5-HIAA (a crude indicator of serotonin turnover) and consumed significantly more alcohol than mother-reared controls (Higley et al., in press). While the

extent to which one can generalize from this research with nonhuman primates to humans is questionable, the striking similarities between the concepts operationalized in the nonhuman primate literature (stress, anxiety, and rearing conditions of neglect) and the concepts of interest in the child development literature (cf. Crittendon and Ainsworth 1989) invite serious consideration. This research with nonhuman primates holds promise for understanding individual differences in reactivity and behavior. This research may also be particularly useful in examining mechanisms by which childhood victimization leads to later alcohol problem behaviors, particularly given the ethical constraints of research with humans.

CONCLUSION

There may be a connection between child abuse and alcohol abuse. It may take the form of alcohol abuse in parents or alcohol intoxication at the time of the abuse incident. The extent to which it is either of these relationships is unclear at the present time. For a variety of very plausible reasons, abused and/or neglected children may grow up to become alcoholics or to have alcohol problems at a higher rate than comparison children. However, the extent to which these relationships describe the experiences of abused and/or neglected children remains relatively unknown at the present time. There are strong hints in the literature that some abused and/or neglected children have problems with alcohol. The extent to which these problems are part of a larger set of problems confronting these children

or a special vulnerability also remains unknown. Given the extent of both problems (child abuse and alcohol abuse), it is clear that there is a tremendous need for methodologically rigorous research that addresses the ways in which child abuse and alcohol abuse are connected.

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Investigating Links Between Childhood Victimization and Alcohol Problems

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In this paper, I will first discuss some findings from our recent studies to clarify some of the points Dr. Widom made on our early work. Second, I will add some thoughts to those Dr. Widom generated on methodological issues.

RECENT STUDIES ON CHILDHOOD VICTIMIZATION AND WOMEN'S ALCOHOL PROBLEMS

In our initial study of the relationships between family violence and women's alcohol problems, 45 alcoholic women in treatment were compared to a random sample of 40 women. Both child abuse, especially father-to-daughter violence, and childhood sexual abuse were found to be significantly more prevalent among the alcoholic treatment sample than the random sample (Downs et al. 1987; Miller et al. 1987). The 1989 study that Dr. Widom cites (Miller et al. 1989) does not show childhood sexual abuse contributing unique variance because it is strongly correlated with delinquency. Based upon the

entire set of analyses conducted for this study, we concluded that both father-to-daughter and childhood sexual abuse were important variables on which to continue focusing in our investigations of the relationships between women's victimization and women's alcohol problems.

Our current work, which is funded by the National Institute on Alcohol Abuse and Alcoholism (NIAAA), is titled "Impact of Family Violence on Women's Alcohol Problems." We are addressing three questions: (1) Is childhood violence related to the development of women's alcohol problems? (2) Is partner violence related to the development of women's alcohol problems? and (3) Do women with alcohol problems experience more partner violence than other women? By childhood violence we mean both child abuse and childhood sexual abuse; childhood sexual abuse includes both familial and nonfamilial sexual abuse. The study has both a retrospective design for the childhood victimization questions and a prospective design for the

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partner violence sections. There were two indepth interviews that were conducted approximately 18 months apart.

There are 472 women in these samples, and they are drawn from five different sample sources: alcoholic women in outpatient treatment, drinking drivers, women in outpatient mental health treatment, victims of partner violence, and women from random households. The drinking drivers represent a group of heavy-drinking women who are not in alcoholism treatment but rather an educational program run by the Department of Motor Vehicles (DMV). Women in alcoholism treatment compared to drinking drivers and the random household sample provide a set of comparisons that explore a range of alcohol problems. Furthermore, this comparison addresses questions of whether there is an increased risk of violence based upon consumption levels, or whether there is, perhaps, a threshold effect.

For the women from the outpatient mental health sample and those in services for partner victimization, approximately half of each of these samples have sufficient indications of alcohol problems to warrant comparisons of women in different types of treatment services, with and without alcohol problems, with women in the random sample. This second set of comparisons allows us to determine whether the relationships between victimization experiences have a special connection to women's alcohol problems or whether victimization experiences are more related to women seeking various types of treatment.

An overview of a few basic findings is relevant for our discussion about childhood victimization. We found that women in alcoholism treatment reported significantly higher rates of father-to-daughter violence as compared to women from random households and women from the DMV program for drinking drivers (Miller et al. 1993). This relationship holds constant, even when we control for parental alcohol problems. Furthermore, paternal verbal aggression remains significantly greater for women in our treatment samples (alcoholism, mental health, shelter) with alcohol problems as compared to women in treatment (mental health, shelter) without alcohol problems. Thus, controlling for treatment effects, father's aggression toward his daughter remains important. Mother-to-daughter violence, in contrast, was not significantly different for women in treatment with alcohol problems from women in treatment without alcohol problems.

We also found that childhood sexual abuse was significantly greater among women with alcohol problems, controlling for parental alcohol problems (Miller et al. 1993). Childhood sexual abuse cannot be attributed to father-to-daughter incest because most of our childhood sexual abuse cases in these samples were perpetrated by someone other than the father or father figure. From our indepth questions we were able to determine, however, that parental alcohol problems sometimes had a rather indirect impact on childhood sexual abuse. A case example that illustrates the indirect way parental alcohol problems impact childhood victimization

is as follows. The father was an alcoholic, and the mother, in an attempt to keep the family together, was working more than one job and was gone a lot from the family. The daughter had a number of problems as an adolescent and turned to a family "friend" for advice. He was someone who showed an interest in her, and she thought her parents were unavailable to her. This "family friend" took advantage of the girl's vulnerabilities and needs, and the relationship became a sexual one. This was a long-term relationship that started on a talking basis, because the girl needed an adult friend, and evolved into a sexual liaison. Thus, we need to think about the complexities of the family alcohol problems and their relationship to childhood victimization and not assume the meaning for the empirical relationships we might find.

THEORETICAL EXPLANATIONS FOR THE CHILDHOOD VICTIMIZATION AND ALCOHOL LINKS

Empirical evidence of connections between childhood victimization and the development of women's alcohol problems prompts us to ask what theoretical explanations might exist to understand these connections. We have hypothesized that one connection is that childhood victimization leads to lower self-esteem, which leads to drinking to cope with negative feelings toward self. We have data on women's stated motives for their entry into heavy drinking patterns, and we will be analyzing those to see if women perceive their entry into heavy drinking as

being related in any way to their victimization experiences. In addition, we have some empirical evidence that women with childhood sexual abuse experiences do report lower levels of self-esteem (Testa et al. 1992).

A second possible connection is that often victims talk about feeling different from other girls their ages. As a result of their sexual abuse experience(s), they report not feeling as good as other girls or feeling as if they are "damaged goods." This may lead to their involvement in fringe or possibly delinquent subgroups, who may value heavy drinking and drug use (e.g., Johnston 1991; Kaplan 1985). This pattern of heavy drinking may evolve from a social learning process connection rather than some kind of internal psychological process (Akers et al. 1979; Elliott et al. 1985; Jessor and Jessor 1977).

Our descriptive accounts have given us some support for this connection. For example, a young woman who was sexually abused decided that she wasn't good enough for her boyfriend. He was "too straight for her" now, and she thought she should break up with him. By her own account, she deliberately destroyed her relationship and sought out "a punk or hoodlum" in the school with whom she developed a relationship. The peer group influences surrounding her new boyfriend included both drug use and delinquency.

Therefore, we have to be very sensitive to the ways young victims label themselves as a result of these experiences and the labels that others generate as a result of childhood experiences. Separation of these issues for males and females is also neces-

sary because the mechanisms and relationship may differ. In addition, identification of these relationships among different subgroups, particularly ethnicity and social class, are issues that must be examined.

THE NEED FOR TRIANGULATION

As stated previously, our methodological approaches are critical to examining these research questions. A variety of methodologies are available to us, and both prospective and retrospective studies are needed. We need to triangulate not only within our studies but also across studies (e.g., Babor et al. 1990; Briere 1992; Cicchetti 1989). If we find convergence when all these different methodologies are used, the findings are more strongly supported. Widom emphasizes the importance of prospective designs in her paper, and I will not reiterate arguments for such designs. However, there are some issues regarding the importance of retrospective design that need to be addressed. With the retrospective studies, it is important that multiple samples, both moderator and mediator variables, and multivariate analyses are incorporated to address some of the limitations of the retrospective studies.

Both retrospective and prospective studies have limitations. The seriousness of these limitations depends on the nature of the research question to be addressed (Gittins 1979; Hindley 1979; Schumm 1990). Widom refers to retrospective recall bias. Since perspectives may change over the years, we need to consider the possibility that the perspectives we hold as adults may be more accu-

rate or more closely mirror the truth than those perspectives we held as children (Beitchman et al. 1992; Beutler and Hill 1992; Russell 1986; Schumm 1990). The elements of secrecy that accompany childhood sexual abuse and the child's definitions of what has happened are likely to undergo transformation as the child ages. Another retrospective bias that has been discussed is inability to remember events. While there are cases of repression, the saliency of victimization events is totally different from the saliency of other kinds of childhood events. The inability to recall commonplace everyday events should not be used to discredit memories of salient events (Aalen et al. 1980; Eich 1984; Schacter 1987). The kinds of events being recalled can determine the extent of retrospective bias.

Finally, the recall of the importance of these events to the individual, in terms of long-term consequences, may be very important and have value in and of themselves (Babor et al. 1990; Maisto and Connors 1992; Midanik 1988; Sobell and Sobell 1990). It may not accurately reflect that truth or reality, but their recall and their memories of those events are important to the way they construct themselves now and think of themselves now.

Prospective designs also have weaknesses. These include problems locating victims over time, huge attrition rates, and low initial response rates for abuse cases even in large-scale epidemiological studies (Briere 1992; Velleman 1992). Prospective designs also require ample investment of time before data are available and pose ethical and legal problems if

researchers uncover unreported events of child abuse/childhood sexual abuse for individuals under the age of 18. There have been some suggestions that researchers collect the data without being required to report such evidence. This is, in my view, an unacceptable route, and moral and ethical concerns require taking proactive steps to protect the child from further harm. However, the research also promises confidentiality to research subjects; this issue has no simple solution. To partially address this dilemma, we can measure potential indicators of abuse at early times and then follow people a long time. Using official data sources and officially identified cases is another way around this dilemma. Of course, the number of children who are officially identified for child abuse and childhood sexual abuse and the number of children who are actually abused are vastly different. Furthermore, there are biases regarding who is identified. Another approach has been to compare general population studies and clinical samples, in which victimization has already been identified.

CONSIDERATIONS FOR OBTAINING SELF-REPORT DATA ON CHILDHOOD VICTIMIZATION

Both prospective and retrospective studies have problems with self-report data and with repression of child abuse, particularly childhood sexual abuse, regardless of what methodologies they use. There are techniques that can be used to overcome that kind of repression. Face-to-face interviews allow us to access sensitive childhood victimization experiences better

than other, less personal methods. On a pilot basis, we tried using anonymous questionnaires, because we thought that this methodology might be superior to doing face-to-face interviews. Many respondents left the whole childhood sexual abuse section of our anonymous questionnaires blank. Others responded no to the first question in the section and did not complete the remaining questions. The rate of reporting of childhood sexual abuse was lower when we asked about it in anonymous questionnaires than when we did the interview face-to-face.

While we have yet to conduct a scientific study to determine why there may be this difference in rates of reporting, my view is that women decide whether the interviewer is going to be horrified by what they say, if the interviewer is a safe person to tell, and if the interviewer has some interest in their life or only in the study. Because childhood sexual abuse has been a closely guarded secret for a long time, they are well versed in keeping the secret and must be convinced to give up their secret, without fear of repercussion. There also may be some biases in whether women will report to a male interviewer. This needs to be tested in a more scientific fashion.

We have used a modified version of the Conflict Tactics Scale (CTS) (Straus 1979; Straus and Gelles 1990), because in measuring violence, it is important to consider verbal as well as physical violence. In our studies, we have examples of cases in which the most traumatic incident was described as a verbal threat, although the victim experienced severe

violence as well. We should not assume that the highest level of harm can be measured by the amount of physical harm that has been done. The CTS has a measure of frequency that can be used for specific time periods. Also, we must decide which years in childhood should be measured: before school, preadolescence, and/or adolescence.

In measuring childhood sexual abuse there is a need for multiple questions of a specific nature rather than a single question like, "Have you ever been sexually abused as a child?" From our work, we have concluded that having the interviewers read the list of behaviors and asking the women to respond "yes" or "no" was an important technique. This indicates to the women that we were comfortable talking about those behaviors. Later we could talk about the most serious childhood sexual abuse in more detail after going through this list of different events. Defining perpetrators is also a critical issue.

Interviewers need to be prepared well. It is a mistake to piggyback onto a longitudinal research design if the researcher is unable to add the appropriate number of questions and if the interviewer cannot complete the interview in a sensitive way. Also, the interviewer cannot read a checklist of violent experiences like childhood sexual abuse or childhood violence and then immediately continue with a different question. The women are being asked to remember events in their life that are salient and should be allowed time to talk about those experiences in a way that is meaningful to them.

Reviewing traumatic events during the interview may cause distressful feelings to emerge after the interview and create problems for some women. To address this issue, we provided a resource list of places in the community where women could seek help. Research interviews cannot be confused with clinical interviews, and research interviewers must be trained to recognize the difference. The research interviewer must be careful not to imply or suggest that a woman who has had traumatic experiences must seek out clinical help or needs clinical help. Furthermore, it cannot be assumed that the clinical services they are receiving are always going to be responsive to issues like childhood sexual abuse.

FUTURE DIRECTIONS FOR RESEARCH

The majority of the women with alcohol problems that we interviewed have experienced both child abuse and childhood sexual abuse. There is a temptation to try to determine which of these victimization experiences make the greatest contribution to women's alcohol problems. Rather than trying to focus on the unique contribution we need to understand the impact of multiple victimization experiences on women's lives. We need to begin to look at what kinds of people have what kinds of problems. Is there a difference between a woman who has experienced both physical abuse and sexual abuse in childhood and a woman who has experienced only one of those?

Researchers interested in pursuing research on childhood victimization need

to have some discussions about measurement issues. Widom writes about some validation of assessment techniques. To assess child abuse there may be value to collecting more sibling reports and more parent *and* child reports. A more difficult issue is obtaining collaterals on childhood sexual abuse. Given the secrecy that often surrounds the event(s), only the perpetrator and the child may know. We might also consider the different ethnographic techniques for tools in assessing some of these issues and the importance of open-ended questions. Finally, prospective designs across generations may be important for us to consider. Both violence and alcohol appear to be transmitted from one generation to another. However, our studies have tended to examine either violence or alcohol, not both, while the real world has alcohol problems and violence in the same families. Our work has begun to address these interconnections, and more work is needed.

Furthermore, we need to devote more attention to studying mothers in these problem-laden families. The children-of-alcoholics literature and studies of the perpetrators of violence have been predominantly focused on the father figure in families. However, many families today are single-parent families, predominantly headed by mothers. If we want to have an impact on the next generation, we must understand the complexity of roles for mothers in our society. We must help mothers to strengthen the techniques they use to support and to protect children from victimization. Furthermore, our focus has been overwhelmingly on the

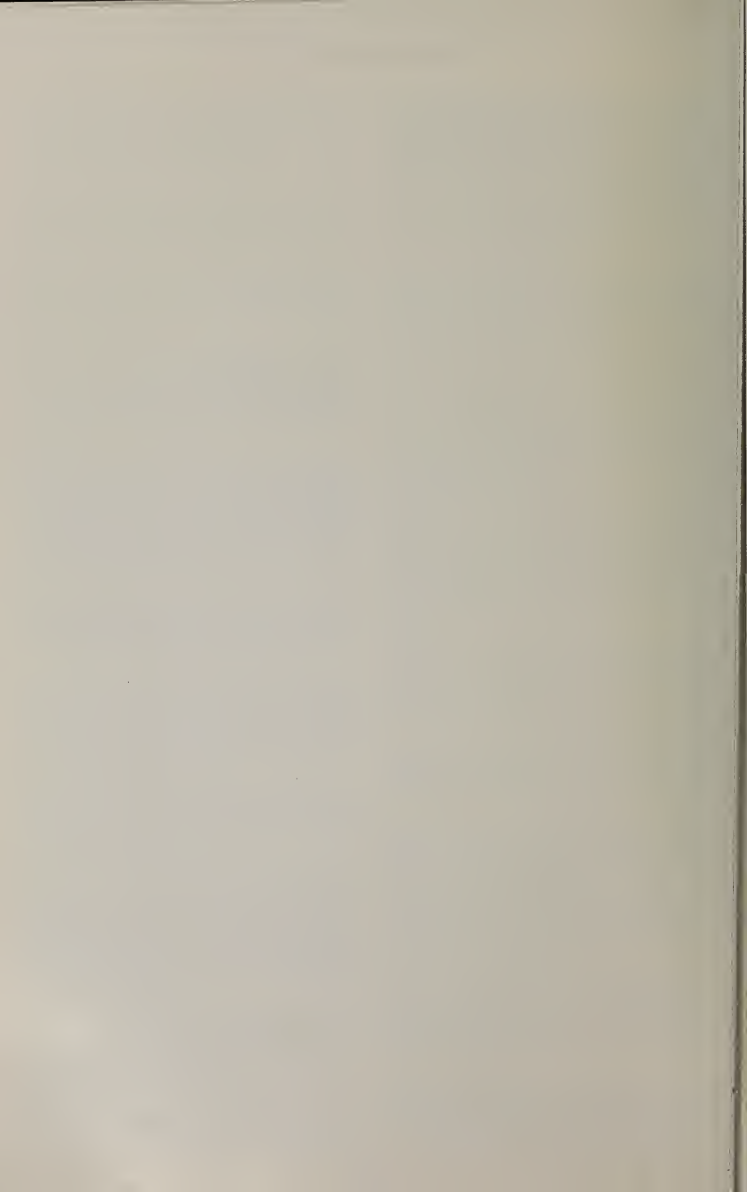
negative; many mothers are very capable of providing good protection for their children. We need to focus not only on the weaknesses in parenting that make children vulnerable to victimization but also on the strengths that protect children from victimization.

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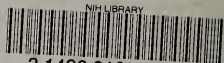
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